# The Role of Collaboration in Everglades Restoration

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Kathryn Irene Frank

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The Role of Collaboration in Everglades Restoration

Approved by:

Dr. Michael L. Elliott, Advisor
College of Architecture
*Georgia Institute of Technology*

Dr. Cheryl K. Contant
Vice Chancellor for Academic Affairs and Dean
*University of Minnesota Morris*

Dr. C. Ronald Carroll
School of Ecology
*University of Georgia*

Dr. Bruce Stiftel
College of Architecture
*Georgia Institute of Technology*

Dr. Bryan G. Norton
School of Public Policy
*Georgia Institute of Technology*

Date Approved: August 21, 2009

THE ROLE OF COLLABORATION IN EVERGLADES RESTORATION

VOLUME I

By

Kathryn Irene Frank

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| | |
|---|---|
| 8.5 SMA | 8½ Square Mile Area |
| BMP | Best Management Practice |
| C&SF | Central and Southern Florida |
| CERP | Comprehensive Everglades Restoration Plan |
| Corps | United States Army Corps of Engineers |
| CROGEE | Committee on the Restoration of the Greater Everglades Ecosystem |
| CSOP | Combined Structural and Operational Plan |
| DAMP | Decomp Adaptive Management Plan |
| Decomp | WCA 3 Decompartmentalization and Sheet Flow Enhancement |
| DEP | Florida Department of Environmental Protection |
| DER | Florida Department of Environmental Regulation |
| District | South Florida Water Management District |
| DOI | United States Department of the Interior |
| DOJ | United States Department of Justice |
| EAA | Everglades Agricultural Area |
| EE | East Everglades |
| EFA | Everglades Forever Act |
| EIS | Environmental Impact Statement |
| ENP | Everglades National Park |
| EPA | United States Environmental Protection Agency |
| FACA | Federal Advisory Committee Act |

| | |
|---|---|
| FWS | United States Fish and Wildlife Service |
| GCE | Governor's Commission for the Everglades |
| GCSSF | Governor's Commission for a Sustainable South Florida |
| IOP | Interim Operational Plan |
| ISOP | Interim Structural and Operational Plan |
| LEC | Lower East Coast |
| LNWR | Loxahatchee National Wildlife Refuge |
| LOTAC | Lake Okeechobee Technical Advisory Council |
| MWD | Modified Water Deliveries |
| NEPA | National Environmental Policy Act |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | National Park Service |
| ppb | parts per billion |
| RECOVER | Restoration Coordination and Verification |
| RPMC | Resource Planning and Management Committee |
| SAGE | Scientific Advisory Group for the Everglades |
| SERA | Southern Everglades Restoration Alliance |
| SETC | Southern Everglades Technical Committee |
| STA | Stormwater Treatment Area |
| SWIM | Surface Water Improvement and Management |
| TOC | Technical Oversight Committee |
| WCA | Water Conservation Area |
| WRAC | Water Resources Advisory Commission |

## SUMMARY

This dissertation examined the impacts of multiple collaborative planning and implementation processes on ecosystem management of the Everglades wetlands of South Florida. In particular, the research focused on collaboration's role in (1) reducing phosphorus pollution in runoff from the Everglades Agricultural Area in the historic northern Everglades and (2) improving the water flow regime in Shark Slough of the southern Everglades. Restoration of the greater Everglades watershed is the largest such initiative in the world, and it may also be the most collaborative, with scores of these processes used at various scales since the mid-1960s.

Ecosystem management is the most advanced approach to environmental governance, and its three tenets of integrative, adaptive, and ecologically protective governance provide a framework for evaluating environmental planning processes. Proponents of collaborative processes believe they are exceptionally suited to promoting the tenets of ecosystem management. Critics of collaboration, however, are concerned with the potential for cooptation of environmental interests, among other issues.

Using qualitative case study methodology, the research found that collaborative processes improved ecosystem management, but not to the degree expected by collaboration proponents. Collaborative processes were integrative of values, information, activities, and political support across the ecosystem, yet integration had biases and limits as a result of groups' strategic behaviors and processes' emphasis on reaching agreement rather than fully exploring the issues. Cooptation of environmental interests was not a significant problem. Collaborative processes promoted adaptation and social learning in specific cases, but at a macro level helped to maintain the status quo of

the dominant water management agencies and technocratic paradigms. Process outcomes were protective of ecological health in that they made steady, incremental progress towards ecological restoration. Progress had significant setbacks however, because collaboratively developed policies were subject to capture by economic interests. Despite the collaborative improvements in ecosystem management, ecological health remains a distant and uncertain prospect for the Everglades.

# CHAPTER 1

# INTRODUCTION

## 1.1 Everglades Governance: Progress Towards Sustainability?

In 1994, after five years of contentious lawsuits and mediated negotiations, the Florida Legislature signed into law the Everglades Forever Act, launching the world's largest project of constructed wetlands to treat phosphorus laden runoff entering the Everglades from the Everglades Agricultural Area to the north.[1] Florida Lieutenant Governor Buddy MacKay remarked, "This is the biggest test yet of the idea of sustainable development…. Can we solve this without having one side or the other totally defeated?"[2]

Environmentalists and scientists were skeptical of the state's commitment to achieving the very low level of phosphorus, less than 10 parts per billion (ppb), needed for the Everglades to retain its characteristic "river of grass" and productive food chain that fed large colonies of wading birds.[3] Indeed the technical plan could only guarantee a level of 50 ppb phosphorus after project construction, with further research necessary to attain the final goal. Florida International University researcher Ron Jones told the Washington Post in 1994, "They'll get to 50 ppb and announce the water clean…I know I'm being cynical. But that's what I think."[4]

Less than a decade later in 2003, with substantial progress towards constructing the 40,000 acres of treatment wetlands and reaching the interim goal of 50 ppb, but under looming deadlines for the state to declare a final phosphorus standard (presumably 10 ppb), the Florida Legislature amended the Everglades Forever Act to create loopholes to allow for water not meeting the state standard. The St. Petersburg Times reported, "Years of painstaking agreements, forged in courts and in legislative arenas, were changed in a matter of minutes."[5] The momentum, however, had been quietly building for several years. During this time, the South Florida Water Management District (District) conducted studies and prepared its Long Term Plan for Achieving Water Quality Goals in the Everglades Protection Area (Long Term Plan), which the District's Governing Board approved several months before the legislative action. William Hoeveler, the federal judge overseeing the 1992 consent decree that settled the U.S. Department of Justice lawsuit that led to the Everglades Forever Act declared the Amendment "clearly defective."[6] Hoeveler said of the sitting Florida governor, "I think [Jeb] Bush is a good man and he means well…But I'm afraid he fell into the hands of those who don't like the Everglades," i.e., the powerful sugar industry, the main contributor of excess phosphorus to the Everglades.[7] The sugar industry protested and Hoeveler was promptly removed from the case. A year after the Amendment, United States Sugar Corporation (U.S. Sugar Corp.), one of the largest sugar producers in the area, declared, "The partnership is working. Everglades restoration is on time and on budget. Only continuing criticism, threats of litigation and political undermining of the process by extremist groups stand in the way of achieving this goal."[8]

The sugar industry was appearing to prevail, yet events took another turn when in 2008 newly elected Governor Charlie Crist made the surprising announcement that the District was negotiating to purchase U.S. Sugar Corp. for $1.75 billion, including its 187,000 acres of farmland in the Everglades Agricultural Area.[9] Rather than purchase U.S. Sugar Corp. to reduce its phosphorus impacts, however, the state and District eyed the company's farmland for construction of water storage reservoirs.[10] This move was the latest step in the District's campaign to find new sources of water for development, including for the growing Lower East Coast population that was expected to increase by 62 percent between 1995 and 2025 to 7.3 million persons.[11] The need for these reservoirs became apparent when a major water storage project, deep aquifer storage and recovery, under the Comprehensive Everglades Restoration Plan (CERP) became unfeasible. The District had initially viewed CERP, a multi-purpose collection of water management projects across South Florida, as the primary vehicle for meeting future water demand.[12] The state and District touted the reservoirs as environmental restoration, since improved water storage capacity would also reduce damaging freshwater discharges to Atlantic and Gulf coast estuaries, and environmental groups were excited by the potential of using the land purchase to restore historic overland flow from Lake Okeechobee to the remaining Everglades.[13]

Indeed, one major ecological objective of the Comprehensive Everglades Restoration Plan, and the main reason for federal involvement in the plan's formulation and implementation, was to improve the natural water flow regime across the remaining Everglades. In addition to phosphorus reduction, ecological restoration needs for the Everglades include removing constructed barriers to wide, shallow flow (sheet flow), increasing flow volume, and improving natural flow timing and variability. Yet CERP, which was authorized in 2000, did not promise to significantly increase flow to the Everglades, and projects to improve sheet flow were not scheduled for completion until decades later. Moreover, the foundational projects in the Shark Slough area upon which restored Everglades flow depends have not been implemented, even though they were authorized two decades ago in 1989. Among the culprits for delay were stakeholder conflicts, inconsistent funding, and bureaucratic procedural requirements.[14] The second National Research Council biennial report on the entire effort to restore Everglades flow criticized, “it appears that planning rather than doing, reporting rather than constructing, and administering rather than restoring are consuming [managers’] talents and time.”[15]

Like the weather of South Florida with its hurricane-induced floods and fire-provoking droughts, Everglades progress towards sustainability was paradoxical, simultaneously bringing environmental improvements amid economic development coups, restoration project starts and stalls, governance innovation that maintained the status quo, and great hope and cynicism uttered in the same breath. Was the Everglades ecosystem making progress towards sustainability, such as in terms of MacKay’s vision of effectively balancing competing needs for the good of the whole? Did governance leaders make good choices about the types of decision making processes and institutional arrangements used in order to maximize progress towards sustainability in the short and long runs? What can we learn from the most ambitious attempt at ecosystem restoration in the world? As the brief story of Everglades governance attests, evaluating a region’s efforts to preserve ecological health while meeting other societal needs is not a simple matter. Correspondingly, it is a challenge to evaluate any single initiative or type of initiative intended to improve environmental governance. It is, however, critical that researchers develop the means to empirically evaluate the choices governance leaders make in order to provide guidance for effective action. As the Everglades case illustrates, there is ample room for improvement, yet it is important that leaders discern what to continue, what to fix, and what to abandon in the quest for sustainability.

## 1.2 Role of Collaboration in Improving Ecosystem Management

The most highly developed and accepted set of principles for regional governance in support of social-ecological sustainability is ecosystem management, and these principles can serve as a framework for evaluating entire governance systems, single initiatives, or types of initiatives.[16] Ecosystem management is a systems approach to environmental governance that advocates decision making and institutional integration and adaptation, within governance and between governance and the social-ecological system (ecosystem), for the long-term goal of protecting ecological health.[17] Ecosystem management can thus be explained through its integrative, adaptive, and protective tenets. Ecosystem management takes a holistic perspective of the ecosystem *and* addresses specific threats to social-ecological health (such as excess phosphorus and the disruption of natural flow in the Everglades). Ecosystem management is expected to lead to immediate ecological improvement as well as capacity building for future ecological benefits.

Key among the types of decision making and institutional innovations intended to enable ecosystem management is collaboration.[18] Collaborative processes bring diverse interests together to discuss and solve common problems, ranging from alternative dispute resolution processes, multi-stakeholder planning and advisory committees, grassroots ecosystem partnerships, and large-scale intergovernmental coordinating bodies. Collaborative processes differ from the traditional decision making approaches of the political, bureaucratic, and judicial governance systems. Incorporating collaborative processes into governance thus changes the manner and goals of communication and decision making thereby resulting in a cascade of changes in knowledge, values, and actions that affect ecosystem management.

Most ecosystem management initiatives include collaboration, and not surprisingly Everglades governance has made extensive use of collaborative processes, perhaps more than any other region in the world.[19] Since the early 1970s there have been ten ecosystem level collaborative processes, beginning with the Governor's Conference on Water Management in South Florida that sought a holistic, consensus-based view of the region's "water crisis."[20] Current ongoing ecosystem level collaborative processes are the federally based South Florida Ecosystem Restoration Task Force and Working Group, the District's Water Resources Advisory Commission, and the federal-state multi-agency partnership to implement CERP. Since the late 1960s, governance of the phosphorus and Shark Slough flow disruption threats has involved sixteen and seventeen ad hoc collaborative processes, respectively.

Because collaborative processes are prominent in Everglades governance, other ecosystem management initiatives, and ecosystem management theory, it is crucial that they be evaluated in terms of their ability to improve ecosystem management, especially ecological outcomes, in the short and long runs. Ecosystem management theory has relied on collaboration proponents' perspectives of collaborative process impacts, probably because of a common reliance on systems thinking (ecology and complex, adaptive systems theory), but in actuality, the theories and research of collaborative processes have been inconclusive and not fully examined empirically. At the level of governance performance, i.e., ecosystem management, proponents state that collaborative processes incorporate environmental values, resolve conflicts, enhance decision making and institutional legitimacy, build social networks, and improve understanding of ecosystems. Critics counter that collaborative processes can negatively impact the environmental bottom line, i.e., ecological health, because they are likely to facilitate tokenism, manipulation, and cooptation of environmental interests.

Past research of collaboration has focused on evaluating the immediate, direct impacts of individual collaborative processes, rather than tracing systemic and cumulative impacts. Moreover, researchers have avoided comparing collaborative process impacts to those that would have likely been achieved through the use of traditional processes alone. Without addressing indirect, higher order impacts and making comparisons to alternative processes, the main theoretical debates, which have substantial implications for the performance of ecosystem management, remain unresolved. Furthermore, the environmental implications of collaboration impacts are unclear without explicitly relating them to ecosystem management theory. The evaluative lens of ecosystem management can also suggest additional types of impacts of importance, such as those related to the regional scale. The regional scale, for instance, has unique sets of stakeholders and institutions that become involved with, and are affected by, collaboration.

### 1.3 Research Question and Design

The goal of this dissertation is to tease out the progress and setbacks of Everglades governance in order to empirically address the question of whether or not collaborative decision making processes improved ecosystem management.[21] The dissertation addresses the core debates concerning the impacts of collaborative processes within the conceptual framework of the integrative, adaptive, and protective tenets of ecosystem management. The dissertation takes a holistic perspective of governance, observing patterns of behaviors that are characteristic of collaborative processes, as well as those of political, bureaucratic, and judicial processes, and their interactions, as environmental problems move through the policy cycle over several decades. The holistic perspective allows observation of the range of impacts expected and comparison with the likely impacts from alternative decision making approaches. Rather than viewing collaboration as being in competition with political, bureaucratic, and judicial processes, this dissertation considers the view that collaborative processes play a unique role that may improve governance performance. The dissertation findings will guide when and how to use collaborative processes for ecosystem management. And, more broadly, this dissertation advances ecosystem management theory by improving understanding of the political, institutional, and social aspects.

To answer the research question, the dissertation focuses qualitative case study analysis on governance of the Everglades phosphorus and Shark Slough flow regime threats. The phosphorus threat dates back to the 1960s when construction of the Central and Southern Florida (C&SF) Project by the U.S. Army Corps of Engineers created the Everglades Agricultural Area in the northern Everglades, encouraging rapid expansion of sugarcane production and other agriculture in the area. The C&SF Project also intensified disruption in natural flow that had been occurring since the early 1900s.[22] Most significantly, the C&SF Project converted the central Everglades into large, shallow reservoirs and cut off the eastern Everglades by a long north-south levee, leaving Everglades National Park as the only portion of the Everglades managed purely for its natural values. The historic flow way of Shark Slough in the southeastern Everglades was severed and drained. The two cases represent different types of environmental issues (water quality and water flow), geographic areas (northern and southern Everglades), and stakeholder groups. However, the fact that both cases are situated within the larger South Florida ecosystem improves the understanding of each case due to cross-case interactions and allows comparison between cases sharing the same context.

### 1.4 Summary of Cross-Case Findings

The dissertation reports the cross-case findings concerning the impacts of collaboration on ecosystem management of the Everglades. The findings explain the role of collaborative processes within the strong and diverse governance context found in the Everglades ecosystem. The dissertation found that collaborative processes did not significantly curtail the use of traditional processes and their impacts on governance. Collaborative processes were largely additive tools to overcome the shortcomings of traditional governance, especially as viewed from the perspective of the bureaucratic system (i.e., the administrative branch of government). On the whole, collaboration improved all three tenets of ecosystem management (adaptive, integrative, and protective governance), but not to the degree suggested by collaboration proponents and with accompanying negative impacts. The Everglades indicated a more complex story.

Collaboration was particularly *integrative* of values, information, activities, and political support across the ecosystem, yet integration had biases and limits. Collaborative processes sought consensus among diverse governmental and stakeholder groups. Toward this end, collaborative processes promoted all values, including ecological health, without addressing the fact that difficult choices would have to be made in order to achieve ecological restoration. Collaborative processes instead assumed that technology and funding would become available to meet all needs, and that policies would work as planned. The consensus approach resulted in problem solving integration only to the degree needed to resolve disputes. The resulting compromise and multi-purpose projects promised environmental benefits, but they also had unexpected negative environmental impacts or were subject to capture by powerful governmental and economic interests.

The political capacity building impacts of collaboration resulted in less criticism of economically dominated policies, but this effect was minor as environmental groups continued to strongly advocate their interests through a variety of means, including litigation. Collaboration improved social and intellectual capacity for ecosystem management, primarily by increasing face-to-face interactions, decision making transparency, and educational communications, but it likewise distracted observers away from the most critical, closed-meeting decision making and gave a veneer of better ecosystem management than actually existed. The ecosystem level collaborative processes and their political capacity building, however, allowed ecosystem management to survive during political and economic changes, and to hold governance accountable to environmental goals regardless of the competing forces (such as population growth).

Collaboration paradoxically enabled *adaptive* governance that maintained the status quo. Collaboration was a planning and consensus building tool used by the governance elite to adapt to and overcome barriers to action caused by conflict and uncertainty. Toward the end of the study period, governance leaders used collaborative processes proactively for high profile issues with planning flexibility. As a result, collaborative processes created opportunities for policy advancement sooner than would have occurred with the traditional processes alone. Governance leaders also used collaboration to facilitate development and acceptance of new elite-supported initiatives, as well as to maintain the dominant decision making authorities and methods (such as the technocratic, or "scientific," approach).[23] As a result of the strategic use of collaboration, the practice also ignored or delayed the resolution of particularly controversial issues. The net result was incremental progress of mainstream policies, many of which had environmental benefits, and steady strengthening of existing bureaucratic status.

Collaborative processes facilitated governance learning about the ecosystem and governance self-reflection, but they did not encourage a radical re-visioning of the ecosystem in order to achieve ecological sustainability. The most important learning that occurred was the slow diffusion of integrated information among diverse groups and the accumulated wisdom of governance leaders with substantial collaborative experience. The strengthening of social capital discussed above also provided increased opportunity for interactions between actors, and hence governance adaptation.

The net result of the integrative, adaptive, and other changes for ecologically *protective* governance was that collaborative processes on the whole allowed governance to be more responsive to all needs – environmental, economic, and governmental – rather than becoming mired in conflict. Environmental progress remained slow, however, since policy gains through collaboration were incremental, technology and funding faltered, and conflict resurfaced. Economic and community groups specific to the phosphorus and Shark Slough cases (i.e., agriculture and residential development) made sacrifices but were successful in protecting their viability. The most powerful economic interest at the ecosystem level, the growing South Florida population, was able to plan for its needs. Yet even this interest group's plans were subject to delay, at which point the collaborative capacity building for ecosystem management resulted in policy to shift more of the burden for finding new water to the communities, rather than rely on the Everglades. The evolution in policy towards greater environmental protection was also made possible by the continued strong advocacy of environmental interest groups, for which cooptation and manipulation by economic interests resulting from collaboration was not a significant problem. Despite the collaborative improvements in ecosystem management, however, ecological health remained a distant and uncertain prospect for the Everglades.

### 1.5 Overview of the Dissertation

The next chapter, Chapter 2: Literature Review and Conceptual Framework, elaborates on the dissertation's research question and the supportive conceptual frameworks of ecosystem management theory and collaboration theory. The research question and conceptual frameworks suggest qualitative case study analysis, for which the design, case selection, and methods are presented in Chapter 3: Methodology. Chapters 4 through 6 provide background information and chronologies of Everglades governance events at the ecosystem level and for the phosphorus and Shark Slough threats. The next three chapters, Chapters 7 through 9, identify the impacts of collaboration for each of the three tenets of ecosystem management: integrative, adaptive, and protective aspects, respectively. The last chapter, Chapter 10: Conclusions and Recommendations, synthesizes the dissertation's findings and presents recommendations for practice and additional research. Appendices A, B, and C provide more information about each collaborative process used for the phosphorus and Shark Slough threats and at the ecosystem level. A list of acronyms and abbreviations is provided on pages ix and x.

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# CHAPTER 2

## CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Governance leaders, such as in the Everglades ecosystem, are increasingly using collaborative processes for environmental decision making and policy implementation, and many scholars and practitioners believe such processes shift governance towards the ecosystem management approach. That is, they expect collaborative processes to enhance governance integration and adaptation corresponding to ecosystem conditions in order to improve social-ecological protection. Fitting the theoretical expectations of collaborative process impacts to the tenets of ecosystem management, however, highlights knowledge gaps and debates. Research tailored to addressing the gaps and debates is needed, and such is the goal of this dissertation. The dissertation asks: does the use of collaborative processes improve ecosystem management?

This chapter motivates the dissertation's research question and design with development of a conceptual framework that merges theories of ecosystem management and collaboration. Ecosystem management theory is the most advanced and accepted set of principles for effective environmental governance at the regional scale and thus provides criteria for evaluating governance processes and institutions.[1] Collaboration theory defines collaborative processes and identifies their many kinds of impacts. Following separate discussions of ecosystem management and collaboration, this chapter summarizes the literature with regard to how collaborative processes either help or hinder ecosystem management. The chapter concludes with a discussion of the knowledge gaps and debates and the research design needed to address them.

## 2.1 Ecosystem Management

Ecosystem management is a complex, adaptive systems approach to environmental governance with a normative bias towards protecting the natural environment and biodiversity.[2] Ecosystem management is used to protect natural systems of importance, such as the Everglades, by taking a holistic view of regional ecological systems. Society may desire to protect whole natural systems because of their landscape characteristics, as matrices supporting their parts, or to provide ecological services such as natural water storage and water quality treatment. Ecosystem management also aims to improve problem solving of narrowly defined problems by viewing environmental problems and solutions as occurring within complex, adaptive social-ecological systems (i.e., ecosystems). A complex, adaptive systems approach to problem solving can improve the likelihood of solution success and develop strategies to effectively respond to, and even foster, the inevitable system dynamics and surprises. The complex, adaptive systems approach promises improvements over traditional governance that is largely based upon a reductionist/mechanistic worldview, an inaccurate characterization of environment and society.[3] Given that ecosystem management is only an approach, and that traditional governance is well established and has experiential wisdom, ecosystem management in practice can enhance rather than supplant traditional governance.

With the focus on definable social-ecological systems, ecosystem management in practice consists of nested governance systems oriented around the ecosystems of importance (such as the Everglades and larger South Florida watershed) and problem solving to address specific ecosystem needs or threats (such as pollution).[4] Theorists have developed three necessary and sufficient ecosystem management tenets based on the characteristics of desirable and resilient (i.e., sustainable) social-ecological systems, the theory of problem solving within complex, adaptive systems, and the constraints imposed by current institutions and cultural norms.[5] The three tenets are conceptually interactive, logically leading to and placing constraints on each other. Together they should foster a healthy, co-evolving social-ecological system. Each of the tenets has also received individual attention outside the context of ecosystem management as means to deal with complex adaptive systems more generally.[6]

First, ecosystem management is *integrative* across the ecosystem and across governance scales in order to systemically solve problems and meet diverse needs (as required by the protective tenet below). Integration is important given that there are strong interactions (by definition of an ecosystem) and intense competition for limited resources.[7] Ecosystem management thus promotes integrative institutions and decision making processes that gather and analyze diverse ecosystem information, jointly solve problems, reconcile competing interests, and coordinate activities across the full range of governmental, public interest, and private actors. Traditional governance, on the other hand, consists of political, bureaucratic, and judicial institutions and decision making processes designed to foster specialization, disjoint territories (usually not corresponding to ecosystem boundaries), competition, and isolated problem solving and interpretation of rules.[8] Researchers have observed traditional systems' attempts at ecosystem management and found serious flaws. Yaffee's study of management of the Pacific Northwest forests and their endangered spotted owl noted that traditional governance was fragmented across jurisdictions.[9] Similarly, Ernst's study of Chesapeake Bay watershed management noted competition among jurisdictions and a lack of coordination among environmental groups.[10]

Second, ecosystem management is *adaptive* to adjust to (and thus allow) ecosystem dynamics that are important for resilience, to keep pace with rapidly changing conditions, information, and values, and to speed the transition towards more sustainable beliefs and practices. Ecosystem management thus requires institutions to actively, rather than passively, view actions as experiments, monitor the social-ecological system, evaluate trends and impacts, and modify activities, and even institutions, values, and worldviews accordingly (i.e., single-, double-, and triple-loop learning).[11] The adaptive tenet emphasizes that decision making is ongoing and not only a front-end activity. Ecosystem management can further improve adaptability by fostering governance system self-organization, creativity, and innovation diffusion through flexible networks, diversity, and redundancy. And, just as integration occurs at different ecosystem scales, adaptation occurs at different temporal scales. Ecosystem management differs from the traditional institutions and decision making processes known for providing only limited opportunities for policy advancement, bureaucratic inertia and ever-tightening control, judicial gridlock and setbacks, lack of sufficient knowledge, and avoidance of creative and bold decisions that have short-term political and organizational risk but substantial long-term social-ecological benefits.[12] Moreover, the lack of integration in traditional governance (discussed for the second tenet) inhibits the level of self-organization, creativity, and innovation diffusion. The Yaffee and Ernst studies, for example, found that traditional governance lacked problem-solving orientation and sufficient knowledge, and limited opportunities for policy advancement, respectively.[13]

Third, ecosystem management is *protective* of the natural environment and societal needs for economic development and social equity in accordance with sustainability theory's "three E's."[14] In terms of the natural environment, ecologists recommend that ecosystem management protect or restore ecological health (consisting of native species, representative native ecosystem types, and evolutionary and ecological processes) in coexistence with human activities.[15] Protection of ecological health is the main aspect considered by this dissertation. The protective tenet follows from the integrative and adaptive tenets as well as places additional requirements on governance. Governance to maintain ecological health differs from traditional governance that has led to substantial ecological degradation and loss of resilience by privileging resource extraction, attempting to tightly control narrowly defined outputs, and ignoring environmental problems and externalities.[16] The Yaffee and Ernst studies concurred, finding that traditional governance did not take a long-term view and economic interests dominated policy making, respectively.[17]

Traditional governance must undergo significant institutional and decision making process modifications in order to achieve ecosystem management. Theorists and governance leaders have proposed and conducted many types of initiatives to improve governance performance in terms of one or more tenets of ecosystem management. One of the most widely recommended and used types of initiatives is collaboration.[18]

## 2.2 Collaborative Processes

Collaboration theory is rich and includes the definition of collaboration, typologies of collaborative processes, factors of success, and identification of diverse types of impacts. Collaboration theory also addresses conceptual and methodological issues of evaluating collaborative processes. Each of these topics is important to theoretically and empirically relate the use of collaborative processes to outcomes for ecosystem management.

### 2.2.1 Definition of Collaboration, Process Typologies, and Factors of Success

In the United States, collaboration is often viewed as an antidote to the fragmentation, exclusion, contention, and inertia of "traditional" governance that impede effective problem solving and policy implementation.[19] The U.S. Constitution disperses decision making authority among the political, bureaucratic, and judicial systems (roughly aligned with the legislative, executive, and judicial branches), as well as among powers split at different governance scales (e.g., federalism), interest group liberalism (i.e., pluralism), and bureaucratic specialization.[20] Interest groups and agencies have traditionally accessed policy making (or policy blocking) through the political activities of lobbying and interagency communications, advisory councils, quasi-public associations, media campaigns, and ballot initiatives, as well as bureaucratic consultation and public participation, and the courts.[21] As discussed above, these governance characteristics have impeded ecosystem management.

Alternatively, collaborative processes bring representatives of diverse governmental and stakeholder groups together for flexible, face-to-face communication for information sharing, coordination, problem solving, consensus building, and conflict resolution. In practice, such processes manifest as alternative dispute resolution (specifically negotiation and mediation), multi-stakeholder technical panels or advisory groups, interagency coordination groups, community-based partnerships, or some combination of these approaches. Collaborative process outputs include legally binding agreements, but most processes affect policies indirectly through process interactions, jointly developed information, and recommendations.

Collaborative processes adhere to the ideal of communicative rationality whereby discussion and negotiation among the various perspectives improves understanding and decision quality. In comparison, the political system is based upon interactive political bargaining, i.e., pluralist politics in which organizations compete in a "political free market."[22] The bureaucratic system adds a dimension of administrative instrumental rationality that privileges technical analysis in the service of agency or jurisdictional mandates, and the authority of hierarchical institutions.[23] The judicial system is a forum for inter-organizational dispute resolution and it employs highly formalized procedures for hearing arguments and issuing rulings based on legal rationality. Legal rationality emphasizes adherence to laws, institutions, and rulings to ensure standards, fairness, and consistency. Communicative rationality is communal and flexible, whereas traditional governance is competitive and controlling.

The practice of collaboration is diverse. Individual processes vary in the extent to which they orient to the problem, engage stakeholders, and facilitate understanding and consensus.[24] Collaborative processes also differ along political and legal dimensions, such as how much status or legitimacy they have, the resources available, and the authority to implement joint decisions and publicize work products. In reflecting on Everglades governance, for example, Robert Jones, director of the Florida Conflict Resolution Consortium, stated, "The Everglades mediation highlights how each different decision making context, found in the most complex environmental disputes, define the possibilities and the players (both decision makers and experts) and present constraints and challenges for solutions to emerge within that context."[25] Further complicating evaluation, all of these aspects can change over times as processes and their contexts evolve.[26] Collaborative process variability affects the range of possible impacts and limits the ability of empirical research to generalize findings from a single collaborative process.[27]

Scholars have long recognized the potential for adverse effects of poorly conducted collaborative processes, and they have identified process evaluation criteria, called factors of success, related to improved communicative rationality.[28] Proponents believe that better outcomes result from processes that have a greater degree of joint problem solving and consensus building among divergent, highly interdependent interests.[29] Scholars have also noted the importance of contextual factors affecting success, including external political support, prior social and institutional networks focused on the issues of concern, and the timing of recommendations.[30] Many of the current debates concerning the benefits of collaboration center around how high a standard processes must meet in order to yield benefits, whether the standard is practicable, and to what degree communicative rationality can or should replace the competitive and controlling rationalities of traditional governance. These debates can only be resolved through empirical research attuned to the complex relationships between collaborative processes and their governance and social-ecological contexts.

### 2.2.2 Collaborative Process Impacts

Collaborative process evaluation theory is well developed, and scholars have identified a wide range of potential collaborative process impacts, all of which have implications for ecosystem management. Collaborative process impacts include direct effects, such as agreements and improved relationships between process participants, and indirect, higher order effects, such as implemented policies and changes in group behaviors. The claims of collaborative process impacts derive from a mix of theory, empirical studies, and experiential wisdom. Scholars have found empirical support for most of the direct effects, positive and negative. Scholars have only recently begun to conduct empirical studies of the indirect, higher order effects, which are more difficult to observe, since many factors contribute to systemic change.[31] The literature concerning collaborative process impacts falls into two main camps, proponents and critics, and each camp represents different disciplines and emphases.

Collaborative process proponents tend to focus on improvements in problem solving in the short and long runs, with the latter characterized as capacity building and environmental outcomes. This literature is primarily grounded in the planning, policy, and negotiation/dispute resolution disciplines, and much of it is inspired by complex, adaptive systems theory (through the work of Innes and Booher).[32] Mandarano's framework for evaluating the environmental impacts of collaboration sums up the types of impacts considered by proponents.[33] Mandarano combined Gray's criteria for characteristics of collaborative processes, Innes and Booher's criteria for social outcomes (social, intellectual, and political capital; policy innovation; and institutional change), and Koontz and Thomas' environmental output and outcome criteria, along with evaluation of output quality.[34] Social capital describes improved working relationships, trust, and norms of reciprocity; intellectual capital is shared understanding; and political capital represents the ability for parties to honor agreements.[35] Environmental outputs pertain to policy changes, and outcome criteria include observable environmental changes (or, as a proxy, perceptions of environmental change).[36] Output quality includes recommendation aspects such as justification for decisions, detailed plans, and use of scientific information.[37]

Representing the critical perspective of political scientists and political geographers, Walker and Hurley charged, "[a] lack of political awareness…describes much of the [collaborative natural resource management] literature."[38] Indeed, proponents have considered social outcomes to explain improvements in problem solving, such as the generation of political capital to better implement agreements, rather than changes in relative group power, i.e., political restructuring.[39] Indicators of political restructuring resulting from collaborative processes include changes in opportunities for decision making involvement and voice, new beliefs and behaviors of groups and their relation to power, creation of political or institutional tools used to advantage particular groups, and marginalization of certain groups, perspectives, or approaches. Critics are also concerned about the losses in benefits when collaborative processes replace traditional processes, such as the reduction in problem solving capacity or implementation success.

In summary, for the purposes of this dissertation's data analysis and organization of findings, the literature identified three interrelated types of impacts of collaborative processes: (1) process characteristics, including stakeholder representation, problem solving, and conflict resolution; (2) outputs, including policies, coordination, and political support for policies; and (3) capacity building and political restructuring. The types of impacts are interrelated as the scope of impacts expands outward social-environmentally and temporally.

### 2.3 Collaborative Process Impacts on Ecosystem Management

Given the requirements of ecosystem management and the characteristics of collaborative processes discussed above, what do we know about the impacts of collaborative processes on ecosystem management, and what are the gaps in our understanding? The comprehensive literature review yielded the following potential changes in the integrative, adaptive, and protective tenets of ecosystem management.[40] Each potential impact represents a force for changing one or more of the tenets, but the literature review does not indicate the net effect for any tenet. Scholars have, however, extrapolated their findings and theories concerning direct impacts to systemic effects, and in these cases the conclusions become inconsistent. The terms in parentheses indicate the common way the literature describes the type of impact (originating with the work of Innes and Booher).[41]

#### 2.3.1 Integrative Impacts

To begin, some scholars would argue that collaborative processes contribute to *more integrative* governance, because they bring diverse governance actors together for face-to-face dialog, whereas in traditional governance many actors do not communicate directly, or they communicate through highly restrictive processes. Such face-to-face dialog would allow a greater exchange of information and decision making transparency, thus increasing opportunities for public input and group coordination (organizational change), and giving each participant a more holistic, nuanced understanding of the issues and a greater appreciation of stakeholder interdependencies and the need to work together. Face-to-face dialog can improve relationships (social capital) when participants become familiar with the people behind the interest groups. The improved relationships may continue to impact governance after the initial collaborative processes, resulting in strengthened civic networks.

Collaborative processes also potentially improve governance integration if they holistically assemble information and analyze ecosystem issues (intellectual capital), creatively seek win-win solutions (policy innovation), and build shared vision, consensus, and support for collaborative recommendations (political capital). The shared visions and recommendations resulting from collaboration are expected to be highly integrative of diverse values and information. Scholars have noted that collaborative processes are usually place-based and thus provide policy recommendations tailored to each issue or ecosystem. Collaborative processes are generally believed to promote trust and reciprocity, norms of shared power, and appreciation for multiple ways of knowing. All the enhancements in integrative governance can create positive feedback loops promoting greater use of collaborative processes and strengthening of civic networks, and experience with the processes would improve their performance over time.

Other scholars have noted that collaborative processes may contribute to *less integrative* governance when they replace broadly inclusive public participation processes or decision making by individuals or organizations with diverse constituency.

The literature also tempers the magnitude of integration suggested by the proponents. Collaborative processes, for example, may exclude groups unlikely to reach consensus and even when participant representation is broad, a few voices can dominate discussions. Additionally, the literature addresses the *negative effects of increased integration* (of a certain kind) on environmental protection, thus suggesting that tensions exist between the tenets of ecosystem management. Some researchers have described collaborative process outcomes as vague or "lowest common denominator" solutions for which no group is ultimately responsible. Other potential dark sides of integration are groupthink and distraction, or, if taken to the extreme, governmental and economic group cooptation of weaker groups, including environmental interests. There is also the specific concern that collaborative process transparency and politicization can inhibit open communication among some individuals such as scientists.

### 2.3.2 Adaptive Impacts

Collaborative processes are expected to contribute to *more adaptive* governance if they allow governance reorganization around new problems and objects of management (ecosystems), whereas bureaucratic and judicial institutions and processes may be more rigid, time consuming, and subject to distraction by concerns other than problem solving. Collaborative processes are also considered to be efficient forms of communication that allow real-time exchanges among a diverse set of actors, thus aiding coordination among groups. Many scholars believe that collaborative processes yield more creative solutions due to diverse participation, self-organizing dialog, and use of principled negotiation strategies. Collaborative processes can also ease tensions, resolve disputes, and provide flexible (but principled) guidance, thus enabling governance to move forward with policy implementation. And the potential increases in governance integration discussed above, especially enhancements in intellectual and social capital, can facilitate governance adaptation.

Some collaborative process impacts would lead governance to be *less adaptive*. Collaborative processes can require a lot of time and resources, and a ripe context, to be done effectively, and researchers have observed that processes are often not created until there is a major problem or conflict. At times, collaborative processes cannot reach agreement on action or policy, whereas unilateral or more restricted participation would be faster. Critics charge that collaborative process outputs are not exceptionally creative (e.g., representing the lowest common denominator), and, regardless of output quality, groups often revert to standard practices after collaborative processes are over. Governance could also be less adaptive if collaborative processes erode its creative potential by reducing the diversity and strength of organized interest groups. Last, indicating a tension with the protective tenet, governance that is *more adaptive may be subject to problems* if it allows powerful economic interests to capture agreements.

### 2.3.3 Protective Impacts

The impacts of collaborative processes on the protection of ecological health are the most dependent upon premises, and hence debated. Collaboration proponents argue that the use of collaborative processes is *more protective* of ecological health than traditional processes alone for reasons related to the beneficial findings for the integrative tenet. Proponents claim that collaborative processes give greater decision making access to formerly marginalized environmental groups through direct participation and process transparency, and that the processes build groups' capacity for a strong voice (such as through attaining ecosystem and governance information). Furthermore, collaborative processes' exploration of ecosystem interdependencies and opportunities for mutual gain can broaden acceptance of ecologically protective policies. Proponents expect the integrative policies resulting from collaboration to experience better implementation success due to collaboration's improvements in decision quality, political support, governance networks, and trust in government (i.e., the administering agencies).

Critics express concern that the use of collaborative processes can be *less protective* of ecological health, primarily because the processes do not resolve fundamental value conflicts and have inadequate institutional safeguards against domination by powerful governmental and economic groups.[42] Critics maintain that the integrative collaborative process outputs favor the economically-dominated status quo, and that devolution of decision making away from national or international levels abdicates federal responsibility and further privileges economic interests. Critics note that the marginalized (including environmental) groups are less likely to possess the strong communication, analysis, and negotiation capabilities required of effective collaborative processes, and that process design is unable to address these inequities. Additionally, critics charge that the collaborative process outcomes of improved relationships, legitimization of diverse values, and preference for cooperative approaches depoliticize decision making. This can leave disadvantaged participants, and the collaborative processes themselves, vulnerable to others' strategic behaviors and manipulation. At the level of governance, depoliticization would demobilize environmental interests from focusing on ecological health (or associated values) and from pursuing more combative avenues of change necessary to achieve environmental protection; whereas economic interests have narrow, immediate objectives less subject to distraction.

One research project bears special mention because it directly spoke to the impacts of collaborative processes on the protective tenet, including for the Everglades. *Natural Experiments: Ecosystem-Based Management and the Environment* by Judith Layzer examined the environmental impacts of four "ecosystem-based management" initiatives and three comparison cases that used traditional processes.[43] Ecosystem-based management, according to Layzer, "entails collaborative, landscape-scale planning and implementation that is flexible and adaptive."[44] One of the book's ecosystem-based management case studies was planning and implementation of the Comprehensive Everglades Restoration Plan (CERP), including a sub-case of the Modified Water Deliveries Project upon which CERP depends. Layzer concluded for the Everglades case: "The main explanation for CERP's minimal [ecological] protectiveness is that its conceptual basis was generated by a collaborative planning process within a context that heavily favored development interests."[45] Across the cases, Layzer found that "the initiatives whose goals were set in collaboration with stakeholders have produced environmental policies and practices that are less likely to conserve and restore ecological health than those whose goals were set through conventional politics."[46] The reason, Layzer explained, was that "to gain consensus, planners skirted trade-offs and opted instead for solutions that promised something for everyone."[47] Alternatively, "When restoring ecological health is the paramount goal, planners are more likely to approve, and managers to implement, approaches that rely less on energy-intensive manipulation and more on enhancing the ability of natural processes to sustain themselves – even if doing so imposes costs on some stakeholders."[48]

While *Natural Experiments* made the kinds of determinations sought by this dissertation, its main research question, conceptual framework, and methodology differed. The book's research question did not focus on the impacts of collaborative processes, and hence the conceptual framework for understanding the potential impacts of collaboration, and their causal mechanisms, was underdeveloped. Nor did the book give equal weight to the three tenets of ecosystem management, instead devoting most of the analysis to the protective tenet. The book's Everglades case study evaluated the assortment of environmental accomplishments and economic development impacts of one initiative, the Comprehensive Everglades Restoration Plan (and the Modified Water Deliveries Project to a lesser degree). In contrast, this dissertation observed multiple collaborative (and traditional) processes used over decades to address two specific threats to ecological health. The next section explains why the dissertation's research design yields a more nuanced understanding of the impacts of collaborative processes on ecosystem management, and hence short-term and long-term ecological protection.

### 2.4 Implications for Research Design

The literature review indicates that collaborative processes have the potential to both positively and negatively impact governance for each of the three tenets of ecosystem management. On the whole, the critics of collaborative processes charge that the proponents are politically naïve and romanticize the problem-solving and capacity building benefits, whereas the proponents would say that the critics are unduly cynical and paternalistic, and too focused on direct outputs. Upon closer inspection, the debates occur because of incomplete discussion about the magnitude of impacts and their significance on balance (especially in relation to an explicit framework of good governance, such as ecosystem management), extrapolations of theory that have not been fully tested by empirical research, and assumptions about the ability of good process design and application to overcome the potential negative impacts. Additional research is needed to give the assortment of claims better coherence and reconciliation, with links to conditions under which the impacts occur, in order to effectively guide the use of collaborative processes for ecosystem management.

The theories of ecosystem management and collaboration, and the current gaps in understanding, necessitate a comprehensive evaluation approach. Comprehensive examination of all potential impacts on a governance system and its ecosystem, and in relation to the ecosystem management framework of good governance, will allow comparison of the magnitudes of impacts and their significance, and point to other issues important for ecosystem management.

Research should observe the impacts at governance/social-ecological and temporal scales sufficient to report environmental outcomes, capacity building, and political restructuring, and reduce reliance on theoretical extrapolation. Scholars are beginning to recommend the evaluation of collaborative governance rather than solely individual collaborative processes. Genskow and Born, for example, remarked of watershed groups, "[It] is the total array of activities occurring and evolving within the space over time that comprises a watershed management effort,"[49] and "those concerned with [evaluating] integrated water resource management should take a more expansive view of the organizational space in which integrated initiatives take place."[50] Several researchers have reported findings concerning the impacts of collaborative processes at this level of observation, especially in terms of relationships with political, bureaucratic, and judicial processes and institutions. Innes et al., for instance, stated, "informal processes may be deliberately created to make the formal ones work, as for example when two state growth management programs invented collaborative processes to make the court-based, adversarial system produce more satisfactory land use outcomes in Vermont and to supplement the top-down bureaucratic approach in Florida."[51] Cortner and Moote's discussion of the "paradoxes of ecosystem management" suggests the need for governance dichotomies,[52] and authors have noted that collaboration can serve a unique, beneficial role (or niche) by complementing and creating synergies with the traditional approaches.[53] For the Everglades, Jones suggested a role for collaboration: "A key task of the mediator in this complex setting is to help manage the timing of the shifts from one context to another so that the process can move towards resolution and to keep the parties and their experts engaged in the reframing that ensues at these critical junctures."[54]

Scholars' observation of collaborative processes within the larger governance context has also led to greater awareness of the limits of collaborative impacts. Innes et al. reported, "Much was accomplished through [collaborative] CALFED's informal systems, yet the formal [i.e., traditional] system retained the funding, the legal authority, and the prerogative to intervene, provide approval, or simply allow the program to continue."[55] Similarly, Jones reported, "In the East Everglades and Kissimmee River cases, the dispute resolution efforts did identify issues affecting the broader system but these were not within their control or jurisdiction to address and resolve."[56] In considering the "political niche of collaborative conservation," Brick wrote, "Existing policy regimes, embedded in national environmental laws, bureaucracies, and political institutions, are incredibly durable and resistant to change."[57]

Furthermore the research should compare the impacts of collaborative processes relative to that which would likely be achieved through traditional processes alone, and remain mindful of the benefits of traditional processes that may be sacrificed with collaboration. An Innes et al. passage demonstrates explicit comparison of collaborative impacts to the likely alternative: "Collaborative processes have replaced gridlock and litigation; a comprehensive framework with linkages and balance among activities replaced project-by-project decisions; multi-purpose interagency projects increasingly became the norm rather than single agency projects; local and regional solutions were used instead of just centralized decision making; public involvement was greatly increased, with stakeholders playing leadership roles; independent science reviews modified agency- and client-based science; accountability and transparency of decision making greatly increased; and flexible, adaptive management and joint learning replaced mechanistic decision making based on assumptions and mandates."[58]

The Innes et al. passage was not explicit, however, about collaborative process impacts on the bottom line concern of ecological health and other environmental outcomes, thus showing the need for the ecosystem management evaluation framework. To address the protective tenet, capacity building and political restructuring impacts should be observed and compared for environmental, economic, and governmental interests in order to address critics' concerns about who wins and who loses.

The research should also note the characteristics of collaborative processes and their relationships with governance context in order to answer questions about the role and potential of process design and application. Better research designs would select ecosystem management cases that frequently used collaborative processes under conditions supportive of good process quality, thus making the impacts more pronounced (easier to observe) and focusing the research on the potential of collaboration (rather than avoidable issues of poor process design and application).

Figure 1 shows the relationships between the concepts discussed in this chapter. In summary, ecosystem management is the guiding framework for evaluating the use of collaborative processes. Ecosystem management can be expressed as the necessary and sufficient conditions of integrative, adaptive, and protective governance (the three tenets). Collaboration theory provides the range of potential impacts of collaborative processes and explains the importance of considering process and contextual factors. Applying the existing knowledge of collaboration to understand its performance for ecosystem management results in knowledge gaps. The dissertation modifies the collaboration evaluation framework to be more comprehensive and attuned to concerns about the protective tenet (i.e., impacts on ecological health and other environmental outcomes), including recognition of the need to explicitly examine the relative impacts on the main interest groups (environmental, governmental, and economic). The next chapter, Chapter 3: Methodology, discusses the details of how the dissertation applied this conceptual framework and research design to a study of the use of collaborative processes for Everglades governance.

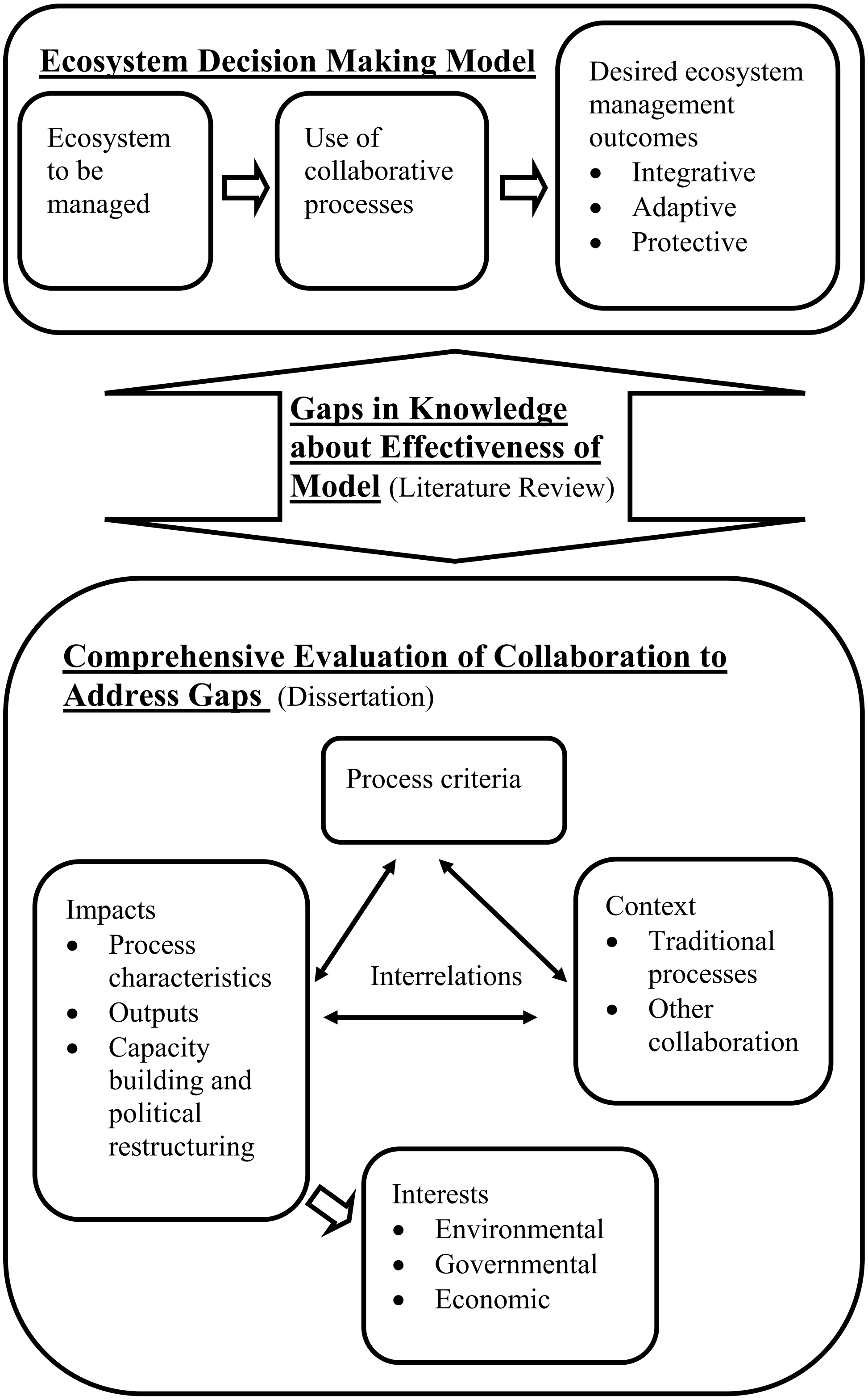


Figure 1 Conceptual Framework and Research Design

## 2.5 Notes

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# CHAPTER 3

# METHODOLOGY

The previous chapter motivated a comprehensive framework for evaluating the role of collaborative processes in ecosystem management. The current chapter explains why case study analysis was the appropriate research design for conducting the evaluation and presents the methodology, with aspects including case selection and analysis, data sources and management, research ethics, methods to enhance internal and external validity, and research limitations.

## 3.1 Research Question and Case Study Design

This dissertation asks: how does the use of collaborative processes affect ecosystem management? Chapter 2 asserted that a comprehensive accounting of the range of impacts of collaboration within the entire governance and social-ecological systems yields a better model for relating impacts to the three tenets of ecosystem management. This approach is consistent with "holistic analysis," whereby "capturing and documenting history, interconnections, and system relationships are part of fieldwork."[1] This approach is also attuned to "context sensitivity," where the traditional decision making processes and institutions, and the social-ecological system, are important aspects of collaboration's interactive context.[2] Context sensitivity enhances the understanding of why certain impacts did or did not occur and provides the basis for recommendations to improve ecosystem management.

The holistic and context-sensitive perspectives, combined with the substantial theory checking and development proposed, suggest the use of a qualitative case study research design.[3] Indeed, several collaboration scholars concerned with environmental outcomes have recommended case study research and associated techniques.[4] Case study analytic techniques include the use of comparative methods within-case (e.g., congruence and process tracing) and across cases (e.g., comparison with actual or counterfactual cases using the methods of agreement or difference).[5] According to George and Bennett, "the congruence method seeks to show that a theory is congruent (or not congruent) with the outcome in a case," and "process-tracing seeks to uncover a causal chain coupling independent variables with dependent variables and evidence of the causal mechanisms posited by a theory."[6] Counterfactual cases are thought experiments about how outcomes would have been different without the intervention of concern (such as collaborative processes).[7]

Even with well-developed qualitative analytic techniques, researchers interested in evaluating the ecosystem management impacts of collaborative processes face numerous challenges, especially when assessing the protective tenet. Determining the environmental impacts of any governance intervention is difficult and rarely done, and this topic has its own literature.[8] Methodological difficulties of evaluating changes in the environment include lack of environmental data, ecological uncertainty, and the long timeframes necessary to observe impacts.[9] Additionally, environmental values are diverse, and the field of evaluating ecological impacts is immature.[10] The typical research methods to investigate causal relationships between interventions and environmental change are also a challenge because of the presence of many confounding variables affecting the environment, diversity of practice and lack of control cases, and tenuous task of predicting what would have happened without the intervention.[11] Given these challenges, researchers typically rely on measuring precursors or proxies for environmental impacts such as implementation of policies and participant opinions about impacts.[12] Genskow and Born, for example, applied the case study approach to describe a "series of temporally and spatially overlapping partnerships and planning initiatives" in three watersheds.[13] Imbedded in their descriptions were claims of causal relationships connecting previous collaborative processes to later ones, to new environmental policies, projects, and programs, and to changes in governance capacity.[14]

Correspondingly, this dissertation research conducted case studies of collaborative governance of two ecosystem threats within a single ecosystem, i.e., two sub-cases within a single case of ecosystem management.[15] Reduction of these two threats is a necessary condition for protection of ecological integrity. Consideration of all ecosystem threats was not feasible; however the study of two threats improved validity over observation of only one threat.[16] The analysis of the impacts of collaborative processes on the three tenets of ecosystem management thus centers on integration, adaptation, and protection of governance for the reduction of specific threats (rather than at a higher scale of the ecosystem).

The focus of the case studies was analysis of the impacts of multiple collaborative processes, but these impacts necessarily involved the larger governance context and social-ecological system. Analytic methods included the within-case congruence and process tracing techniques, cross-case analysis (literal replication), and counterfactual comparisons. The counterfactual cases represented what would have likely happened without the use of collaboration (i.e., using traditional approaches alone) and were derived from case participant interviews, the patterns of traditional governance behaviors in the cases, and the literature describing traditional governance.

An additional analytic technique was needed in order to relate the various impacts of collaborative processes to the net effects for ecosystem management. The technique involved comparing the direction (positive or negative) and magnitude of impacts for each of the three tenets of ecosystem management, similar to force field analysis.[17]

## 3.2 Case Selection

### 3.2.1 Case Selection Criteria

The dissertation research sought multiple cases of highly collaborative governance of specific, significant threats to the health of a single ecosystem, where the observation period was long enough to include the implementation and evaluation phases of the policy cycle.[18] This research design was similar to that employed by Ernst, who examined governance of two threats to the ecological health of the Chesapeake Bay (excess nutrients in watershed runoff and overfishing of blue crabs).[19] Ernst's study, like this dissertation, used the congruence method to examine the fit of theories to the evidence, and process tracing to link governance activities to environmental policies and tangible environmental outcomes for the specific threats.[20]

Another desired feature, but not critical, was for the cases to contain a degree of environmental success. This increased the chance that the cases would demonstrate the potential of collaboration to yield improvements in ecosystem management (the dominant perspective among ecosystem management theorists) and the corresponding factors of success. The dissertation's interest in examining factors of governance success did not preclude, however, recognition of shortcomings and analysis of their factors, especially in the areas of concerns identified by collaboration critics. Yin called this approach of working backwards from outcomes towards theories "rival explanations as patterns."[21]

Multiple cases were also intended to represent different kinds of environmental threats, governance actors, and dominant decision making and institutional systems in order to explore collaboration's robustness for producing the observed outcomes (i.e., theoretical replication).[22] But, by having both cases situated in the same ecosystem, the effects of confounding variables would be minimized, allowing a greater understanding of each case context and overall governance, including the significance of the ecosystem-level collaborative processes.

### 3.2.2 Case Selection

Meeting the case selection criteria, the dissertation conducted case studies of collaborative governance of two threats facing the Everglades ecosystem in South Florida.[23] The *phosphorus case* was governance to reduce the ecological degradation of the central and southern Everglades resulting from excess phosphorus in runoff from the Everglades Agricultural Area (EAA).[24] Governance leaders first observed eutrophication of the Everglades in the early 1970s and began policy making to reduce it in the late 1980s. By 2008, governance had completed the world's largest system of constructed wetlands for nutrient removal, thus reducing phosphorus levels entering the Everglades, although not to the degree needed to halt degradation. Evaluation of ecological outcomes in the phosphorus case focused on reduction of phosphorus levels.[25] Governance in the phosphorus case was highly political and judicial, involving the sugar industry, significant attention of environmental interest groups, the U.S. Department of Justice, and the Miccosukee Tribe of Indians of Florida. Over time, governance for phosphorus reduction became more bureaucratic with restoration plan implementation by the South Florida Water Management District. Between 1973 and 2008, decision making to support this governance involved sixteen collaborative processes to address the phosphorus threat and closely linked issues. The collaborative processes are listed in chronological order and described in Appendix A.

The *Shark Slough case* was governance to restore natural flow regime to the Shark Slough region of the southern Everglades. Disruption of Shark Slough flow first occurred in the early 1900s with the construction of drainage canals to the north and the Tamiami Trail highway at the slough's headwaters. Disruption intensified in the 1960s with construction of the Water Conservation Areas in the central Everglades, the North-South Levee severing the eastern Everglades, and a canal and levee bisecting Shark Slough, all components of the Central and Southern Florida (C&SF) Project. Ever since the completion of the C&SF Project, Everglades National Park in the southern Everglades has advocated restoration of a more natural flow regime, resulting in operational changes and planned structural changes, including the Modified Water Deliveries Project authorized in 1989 and the WCA 3 Decompartmentalization and Sheet Flow Enhancement Project of the Comprehensive Everglades Restoration Plan adopted in 2000; however neither project was completed by the end of the dissertation's study period. Evaluation of ecological outcomes in the Shark Slough case focused on restoration of a more natural flow regime to the slough and its headwaters to the degree possible given the new limitations of land development and soil subsidence.[26] Governance in the Shark Slough case was highly bureaucratic, with Everglades National Park, the U.S. Army Corps of Engineers, the South Florida Water Management District, and the U.S. Fish and Wildlife Service playing key roles. Private agricultural and residential interests in the East Everglades, and the Miccosukee Tribe, were also involved. Governance included seventeen collaborative processes focused on Shark Slough flow restoration and closely linked issues. The collaborative processes are listed in chronological order and described in Appendix B.

Also having the potential to affect governance of the two threats were ten ecosystem level collaborative processes concerned with regional environmental governance, with the first occurring in 1971 and with three active at the end of the case study period. Moreover, the phosphorus and Shark Slough threats were directly linked within the ecosystem. For example, governance leaders recognized that increasing Shark Slough flow volume could be ecologically counterproductive if the additional flow contained excess phosphorus (such as from the Everglades Agricultural Area). And, efforts to restore flow to the Everglades (and meet other water management needs) interacted with EAA water use and land use. The collaborative processes are listed in chronological order and described in Appendix C.

### 3.3 Case Construction and Analysis

The initial, preliminary phase of the research was data gathering to define the case study boundaries. For instance, it was not initially known whether the dissertation would examine governance of all sources of excess phosphorus or only a single source, such as the Everglades Agricultural Area. Information that was not directly needed for case construction and analysis improved internal validity by improving the understanding of case context.

Once case boundaries were established, case construction and analysis proceeded in four steps, with each step building upon the previous steps, progressively focusing the analysis towards answering the question of how the use of collaborative processes affected ecosystem management and making recommendations for improvement. The four steps were: (1) constructing case chronologies for governance of the two threats and at the ecosystem level (the context), (2) observing the threat impacts of the ad hoc and ecosystem level collaborative and traditional processes, (3) relating the collaborative process impacts to the three tenets of ecosystem management, and (4) explaining the impacts in terms of the characteristics of collaborative processes and the governance context. Each step reoriented the analysis according to different aspects of the conceptual framework (see Chapter 2, especially Figure 1) and required additional data gathering. The third and fourth steps went beyond theory checking and evaluation into the realm of theory development. The four-step model of the analysis is a simplification, however, since there were several iterations of individual steps and the entire analytic process.

In the first step, constructing case chronologies, the purpose was to establish historical event relationships over time for the phosphorus and Shark Slough cases, and at the ecosystem level. The ecosystem level case chronology provided background, contextual information for the phosphorus and Shark Slough cases. The case chronologies covered the major transformations to the ecosystem from the early 1900s to

2009, with finer resolution beginning with the most significant event contributing to the two threats, construction of the Central and Southern Florida Project in the early 1960s. The governance and ecosystem activities and events in each case chronology were linked by causal relationships identified through sufficiently detailed data and reputable causal assertions (e.g., from secondary sources such as scholarly case studies, historical accounts, and news articles). The case chronologies required information at the level of detail to address who was involved in decision making, why they were involved, how they interacted, what they decided, what happened to the outputs, and how the environment was affected. This step also included a historical account of the use of collaboration across the state and in South Florida. The data and causal relationships found in the case chronologies provided the foundation for successive analytic steps that focused on theory verification and development. To provide the reader with an orientation to the cases, Chapters 4 contains overviews of the case chronologies (for the ecosystem-level background, and phosphorus and Shark Slough cases, respectively), whereas the amount of data gathered and level of causal connections established for this dissertation were much greater.

The second step focused on the two cases, i.e., collaborative governance of the phosphorus and Shark Slough flow regime threats, and examined collaborative processes' (1) process characteristics, including problem solving and conflict resolution; (2) outputs, including policies, coordination, and political support for policies; and (3) capacity building and political restructuring. The research explicitly examined collaborative process impacts on environmental, governmental, and economic interests and compared them to those of the political, bureaucratic, and judicial processes and institutions. The literature review and conceptual framework described in Chapter 2 provided specific indicators of the various kinds of impacts. To guide identification of problem solving impacts, the policy cycle categories of knowledge generation and policy advocacy were considered.[27] Capacity building included changes in intellectual, political, social, and institutional capacity. Political restructuring examined changes in relative power of groups and their strategic behaviors. To provide a baseline for the political restructuring impacts, the analysis qualitatively assessed the relative power of governmental, environmental, and economic interests prior to the first collaboration in 1971, including via a chronicle of environmental interests' campaigns and policy accomplishments (e.g., the creation of Everglades National Park). The identification of collaborative process impacts required additional data gathering beyond the case chronologies, such as review of collaborative meeting minutes, reports, secondary case studies, and dissertation interviews. The processes examined were the ad hoc collaborative processes concerned with the two threats of interest and the ecosystem-level collaborative processes (but only to the extent that they affected governance of the two threats).[28]

The third step, evaluation of ecosystem management outcomes, analyzed the cross-case findings from the first two steps in order to determine whether governance was more or less adaptive, integrative, and ecologically protective because it used collaborative processes. This analysis required complex comparison of the net effects of the various impacts, further analysis of causal relationships, and the construction of counterfactual cases and scenarios of the likely future (based on the current situation and past tendencies). The results of the third step are reported for the integrative, adaptive, and protective tenets in Chapters 5, 6, and 7, respectively.

The fourth step, explaining the impacts, identified the characteristics of collaborative processes, both intrinsic to communicative rationality and potentially variable, and the governance and social-environmental contexts that led to the observed impacts for ecosystem management. The results of the fourth step are incorporated into Chapters 5, 6, and 7 and provided the basis for the recommendations for improving the use of collaborative processes (Chapter 8). Table 1 provides an overview of the four analytic steps, the analytic techniques applied, and types of evidence used.

Table 1 Summary of Case Construction and Analysis

| **Analytic Step** | **Analytic Techniques** | **Types of Evidence** |
| --- | --- | --- |
| 1. Case chronologies | Process tracing | Major governmental and environmental events |
| 2. Impacts based on collaboration theory (process characteristics, outputs, capacity building and political restructuring for all interests) | Process tracing, congruence, literal replication (cross-case analysis), counterfactual cases | Major events, collaborative process details |
| 3. Impacts for ecosystem management (integrative, adaptive, and protective) | Literal replication, net effects, theory building | Actual and predicted environmental outcomes, policies as proxies |
| 4. Process criteria and context | Process tracing, counterfactual cases, theory building | Collaborative process details, context data |

**3.4 Data Sources and Management**

3.4.1 Data Sources

Data for the case chronologies, ecosystem context, and details of collaborative processes came from several types of primary and secondary qualitative sources. The main data sources for the case chronologies and ecosystem context were primary documents (such as governance plans, legislation, reports, and organizational websites) and archival records (such as meeting minutes, meeting presentations, and court transcripts), most of which were available on the Internet. Secondary sources, such as books detailing the history of South Florida governance and environment, were especially important, as were newspaper articles. Data sources providing details of collaborative processes included published case studies and organizational websites with information about collaborative process purposes, participants, protocols, reports, resolutions, and meetings (such as through posted meeting minutes, agendas, presentations, and online meeting videos), as well as data produced for this dissertation through interviews and process observations. Collection and analysis of detailed collaborative process data occurred up to March 2007. Major Everglades governance events were observed and incorporated into the analysis up to finalization of this dissertation in July 2009.

This dissertation research included a five-week field visit in South Florida during April-May 2004. The field visit included observation of six collaborative processes to manage the Everglades, with 25 hours of attendance. The observed processes were the South Florida Ecosystem Restoration Task Force and Working Group, the Water Resources Advisory Commission, the CSOP Advisory Committee, and two Comprehensive Everglades Restoration Plan RECOVER (Restoration Coordination and Verification) committees. The CSOP Advisory Committee was the only collaborative process observed that focused on a case (the Shark Slough), whereas the other processes were at the ecosystem level. Observations of the collaborative processes were hand-written.

The dissertation research included interviews with 20 governance leaders, many of whom had participated in one or more collaborative processes, and one person who did not participate in collaboration. The governance leaders represented the public (as elected officials), federal, state, and regional agencies, a tribe, major stakeholder groups, and collaboration professionals. Several interviewees were technical experts. Table 2 indicates interviewee representation of the various categories, where individual interviewees can represent more than one category.

Table 2 Interviewee Representation

| **Organization Represented** | **Number of Interviewees** |
|---|---|
| Federal agency | 10 |
| State or regional agency | 4 |
| Tribe | 1 |
| State legislature | 1 |
| Environmentalist | 2 |
| Development or community | 1 |
| Collaboration support | 7 |
| Not involved in collaboration | 1 |

The main intent of the interviews was to triangulate the case study findings regarding the impacts of collaboration. A secondary intent of the interviews was to add information to construct the case chronologies and details of collaborative processes. Protocols for ensuring ethical treatment of human subjects, including the interviewee recruitment script and consent form (Appendix D), were developed with the assistance of the Georgia Institute of Technology's Institutional Review Board. Most of the interviews were conducted in person during the field visit, with several conducted on the telephone (one in April 2004, one in May 2004, and two in July 2007), and each lasted from one to three hours. Interview questions focused on understanding the interviewee's impression of the role of collaboration in Everglades restoration and varied depending on the interviewee's organizational affiliation and experience with collaboration or other governance processes. Hand-written notes were taken of all interview responses. The political sensitivity of the interviews necessitated assurance that the interview sources not be quoted or attributed by name (a few interviewees requested this), although this reduces internal validity. The dissertation cites interview responses in terms of broad categories such as "agency employee" or "environmental stakeholder."

The five-week field visit incorporated an extensive tour of the South Florida region, from the headwaters of the watershed in Kissimmee, Florida, to its terminus in the Ten Thousand Islands and Florida Bay. The regional tour improved the dissertation's analysis of environmental impacts and the role of the environment by grounding it in first-hand experience. Features observed included the Kissimmee Chain of Lakes, the Kissimmee River and restoration projects (toured during the District-sponsored Kissimmee River Roundup restoration celebration), Lake Okeechobee/Caloosahatchee River/St. Lucie River, the Indian River Lagoon, the Everglades Agricultural Area and drainage canals (e.g., the Miami Canal), the Loxahatchee National Wildlife Refuge, Water Conservation Area 3 and L-67 levees and canals, Tamiami Trail and Alligator Alley highways, Miccosukee Tribe establishments, Big Cypress National Preserve and Seminole Tribe Reservation, 8.5 Square Mile Area, the Frog Pond agricultural area and C-111 canal system, interior Everglades National Park and Shark Slough/Taylor

Slough/Florida Bay, North-South Levee and Lake Belt area, Biscayne Bay, and east coast urban/urbanizing areas (Homestead, Miami, Fort Lauderdale, West Palm Beach, etc.). Additionally, in 2002, the researcher participated in an ecologically oriented tour of Southwest Florida, including Naples, the Ten Thousand Islands, the Picayune Strand restoration area (also known as Southern Golden Gate Estates), and Corkscrew Swamp Audubon Sanctuary.

While case construction and analysis sought completeness and accuracy of data, data availability and sources were constraints on these objectives and undoubtedly introduced some bias in the analysis. Fortunately, data about Everglades governance and environmental conditions were abundant and data gaps at the analytic scale and level of detail applied were minor. Areas where data were more abundant include the "politics" up to passage of the Comprehensive Everglades Restoration Plan in 2000 (e.g., *The Swamp: The Everglades, Florida, and the Politics of Paradise* and *River of Interests: Water Management in South Florida and the Everglades, 1948-2000*), recent ecosystem level collaborative processes since the late 1990s (e.g., the meeting minutes and presentations of the South Florida Ecosystem Restoration Task Force and Working Group), and the interview opinions of governance participants active since the mid-1990s.[29] Data on the politics since CERP and threat-level collaborative processes were sufficient, and case studies of early collaborative processes fill in the gaps about opinions of their impacts. Triangulation of data from multiple sources, data quality assurance based on source credibility (especially for secondary sources), and checking the logical fit of data improved the dissertation's internal validity. This dissertation reports a sampling of the data used in the analysis, and thus serves as a source for future researchers to build upon and critique.

### 3.4.2 Data Management

The data generated for this dissertation was voluminous. Data management was essential to research efficiency, internal validity, and proper citing of sources. Fortunately, most of the data was available electronically, which facilitated acquisition and text searches. The electronic files were downloaded and organized according to the dominant anchor of the data: process or organization that produced it, restoration project, or environmental issue. Field visit and interview data, such as the researcher's interview transcripts and descriptions of collaborative processes, as well as notes taken of non-electronic sources (e.g., books and reports only available in hard copy) were also stored electronically.

The researcher used several structured approaches discussed in Section 3.3 to review the data and assemble it into the case chronologies, with iterative construction. The researcher took notes during data review and kept source information alongside the processed data (a chain of evidence). Thus the case study database contained raw data, data notes, and analysis results.

## 3.5 Research Ethics, Validity, and Limitations

### 3.5.1 Research Ethics and Internal Validity

Research of collaborative environmental governance has many ethical considerations that affect methodological and reporting choices.[30] Ethical obligations to research subjects and the larger scholarly and professional communities include conducting the highest quality research possible and explicitly stating research applicability and limitations.

To enhance research internal validity and attention to ethical issues, a highly qualified Thesis Advisory Committee reviewed the dissertation methodology and results. The dissertation committee chair, Dr. Michael Elliott at Georgia Tech, is an expert in environmental conflict resolution and collaboration, including its use in Florida. Dr. Elliott is co-founder and Director of Research for the Consortium on Negotiation and Conflict Resolution, and co-founder and former Director of the Southeast Negotiation Network. Dr. Cheryl Contant, currently Vice Chancellor of Academic Affairs and Dean at the University of Minnesota Morris and formerly Chair of the City and Regional Planning Program at Georgia Tech, is an expert on environmental and watershed planning, especially program evaluation and the identification of cumulative impacts. Dr. Ronald Carroll is an ecologist with the University of Georgia's Odum School of Ecology, an expert on water resource policies and ecosystem management, and Co-Director of the River Basin Center. In addition to the members of the Advisory Committee, the Dissertation Examination Committee included Drs. Bruce Stiftel and Bryan Norton. Dr. Stiftel is Chair of the City and Regional Planning Program at Georgia Tech and former faculty member in the Department of Urban and Regional Planning at Florida State University. Dr. Stiftel has extensive research and outreach experience with environmental conflict resolution and collaboration in Florida, and he was a founding member of the Florida Conflict Resolution Consortium. Dr. Norton is Distinguished Professor of the School of Public Policy at Georgia Tech and an internationally renowned environmental philosopher and public policy expert who specializes in collaborative and adaptive ecosystem management.

The Georgia Institute of Technology Institutional Review Board (IRB) provided additional ethical and methodological oversight. The Georgia Tech IRB approved the dissertation's protocols concerning human subjects, including the interviewee recruitment script and consent form (in Appendix D). As approved by the IRB, interviewees gave verbal consent rather than with written signature. All 20 interview participants expressed support for this dissertation's research objectives and appeared to communicate openly and honestly. Two persons requested interviews for this dissertation declined to participate, but neither expressed disapproval of the research. One of these persons referred me to a colleague to conduct the interview.

In keeping with Prokopy's recommendations, this dissertation took additional precautions to safeguard individual interviewee interests by hand-writing interview notes, keeping citations of interviews to a minimum (especially when the information would risk negative impacts for the interviewee), and using citations that do not identify individuals (instead using a general identifier such as "agency employee").[31] Similar precautions were taken with the transcripts of public meetings, including those available on the Internet, since it was not necessary for this research to single out individuals unless the comments were made for broad public dissemination (such as through interest group publications or public statements of government officials). This dissertation methodology did not arrange for participant review of the results prior to finalization, because the diversity of perspectives and interests created challenges in choosing which individuals or organizations to conduct the review, instead relying on external review by the dissertation committee. Several interviewees expressed an interest in receiving the final dissertation, and the researcher committed to providing all interviewees an electronic copy of the dissertation upon completion. This approach was in keeping with Prokopy's guidelines for ethical nonaction research of collaborative environmental governance.[32]

Beyond risk to individuals through reporting interview results, this dissertation poses possible controversy and negative reactions because it highlighted some of the shortcomings of a high-profile governance system (Everglades restoration) composed of specific collaborative processes, organizations, and individual participants. Mitigating this concern is the fact that Everglades governance has already weathered biting criticism by independent government reviewers, interest groups and organizations, the media, and researchers.[33] This dissertation, however, is the first study to report the full range of impacts of collaborative processes on Everglades restoration, both positive and negative, building on the existing scholarly research.

Because of the personal and political sensitivities, the researcher made every attempt to present the dissertation in a balanced manner with scientific integrity and a desire for constructive evaluation of Everglades governance. To an extent, the advisory and examination dissertation committees provide an outside, yet informed perspective on the tone of the dissertation. Any potential dissertation errors, omissions, or other problematic aspects, however, are the responsibility of the researcher alone.

### 3.5.2 Research Limitations and External Validity

The empirical focus on the Everglades ecosystem illuminates phenomena occurring with typical ecosystem management; however the findings also reflect conditions that are not found in all instances, thus limiting the ability to generalize the findings.[34] Potentially significant characteristics that would affect collaborative governance outcomes include the geographic scale of management, the institutional affiliations of conveners and participants, and the purpose and scale of institutional action. Thus, this dissertation's results appear to be most relevant to politically intense, large-scale and multi-hierarchical ecosystem-oriented restoration efforts, especially with respect to water resource management. Limits to generalizing to these situations include the unique characteristics of the South Florida environment (after all, "There are no other Everglades in the world"[35]), the presence of a strong watershed-based water management agency and a national park, and Florida politics (e.g., the impacts of Florida being a "swing state" in U.S. presidential elections). Another factor is the time period under analysis and its implications for context, such as the political support for or against ecosystem management and collaboration (e.g., the difference between the Bill Clinton and George W. Bush administrations, and between the state's Lawton Chiles and Jeb Bush administrations). As Genskow and Born stated, "It is important for resource managers and funding organizations to recognize that formulaic assessments of 'success' and inflexible prescriptive approaches to develop collaboration may serve most effectively as general 'guidance' but have limited use for successfully undertaking integrated management efforts in watersheds."[36]

### 3.6 Notes

[1] Michael Quinn Patton, *Qualitative Research and Evaluation Methods*, Third Edition (Thousand Oaks, CA: Sage Publications, 2002), 60.
[2] Ibid, 62.
[3] Robert K. Yin, *Case Study Research: Design and Methods*, Second Edition (Thousand Oaks, CA, Sage Publications, 1994). ; Alexander L. George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences* (Cambridge, MA: MIT Press, 2005).
[4] Kenneth D. Genskow and Stephen M. Born, "Organizational Dynamics of Watershed Partnerships: A Key to Integrated Water Resources Management." *Journal of Contemporary Water Research & Education* 135 (December 2006): 56-64, 62. ; Tomas M. Koontz and Craig W. Thomas, "What Do We Know and Need to Know About the Environmental Outcomes of Collaborative Management?" Special Issue, *Public Administration Review* 66 (2006): 111-121, 117.
[5] Yin, *Case Study Research.* ; George and Bennett, *Case Studies and Theory Development*. ; Koontz and Thomas, "What Do We Know."
[6] George and Bennett, *Case Studies and Theory Development*, 153.
[7] George and Bennett, *Case Studies and Theory Development*.
[8] Lori S. Bennear and Cary Coglianese, "Measuring Progress: Program Evaluation of Environmental Policies." *Environment* 47, no. 2 (2005): 22-39. ; Koontz and Thomas, "What Do We Know."
[9] Koontz and Thomas, "What Do We Know."
[10] Bryan Norton, *Sustainability: A Philosophy of Adaptive Ecosystem Management* (Chicago: The University of Chicago Press, 2005).
[11] Koontz and Thomas, "What Do We Know."
[12] Mette Brogden, "The Assessment of Environmental Outcomes." In *The Promise and Performance of Environmental Conflict Resolution*, edited by Rosemary O'Leary and Lisa B. Bingham (Washington, DC: Resources for the Future, 2003). ; Bennear and Coglianese, "Measuring Progress." ; Genskow and Born, "Organizational Dynamics of Watershed Partnerships."
[13] Genskow and Born, "Organizational Dynamics of Watershed Partnerships."
[14] Ibid.
[15] Yin, *Case Study Research*
[16] Ibid.
[17] Wikipedia, "Force Field Analysis," http://en.wikipedia.org/wiki/Force_field_analysis (accessed August 20, 2009).
[18] A threat to ecosystem health causes the ecosystem to transform into a degraded, less valued state (e.g., significantly different that the historical system with less ecological productivity and native biota). See: Stephen Jerome Woodley, James Kay, and George Francis. *Ecological Integrity and the Management of Ecosystems* (Boca Raton, FL: CRC Press, 1993).
[19] Howard R. Ernst, *Chesapeake Bay Blues: Science, Politics, and the Struggle to Save the Bay* (Lanham, Maryland: Rowman & Littlefield, 2003).
[20] Ibid.

[21] Yin, *Case Study Research.* ; George and Bennett, *Case Studies and Theory Development*.
[22] Yin, *Case Study Research.*
[23] Michael Boswell, "Redefining Environmental Planning: Evidence of the Emergence of Sustainable Development and Ecosystem Management in Planning for the South Florida Ecosystem" (Doctoral dissertation, Department of Urban and Regional Planning, Florida State University, 2000).
[24] The fact that inflow to the remaining Everglades was a mix of EAA runoff and water from other sources (e.g., Lake Okeechobee, which has very high phosphorus concentrations) complicated evaluation, but the dissertation took this into account and focused EAA sources of phosphorus.
[25] And to a lesser extent planning for change including other potential water quality threats based in the EAA (such as urbanization).
[26] Ecological progress for Shark Slough was a matter of reducing flow west of Shark Slough, increasing flow to Northeast Shark Slough, reintroducing flow to the headwaters to Northeast Shark Slough, with all flows exhibiting ecologically beneficial characteristics such as natural timing (related to rainfall and evapo-transpiration) and sheet flow (uniformity, depth, speed, and direction).
[27] Walter A. Rosenbaum, *Environmental Politics and Policy.* Seventh Edition (Washington, DC: CQ Press, 2008).
[28] Thus this dissertation is not a full evaluation of the ecosystem level collaborative processes per se, only in regards to their effects on the two threats of interest.
[29] Michael Grunwald, *The Swamp: The Everglades, Florida, and the Politics of Paradise* (New York, NY: Simon & Schuster, 2006). ; Matthew C. Godfrey, "River of Interests: Water Management in South Florida and the Everglades, 1948-2000" (U.S. Army Corps of Engineers, 2006).
[30] Linda Stalker Prokopy, "Ethical Concerns in Researching Collaborative Natural Resource Management." *Society & Natural Resources* 21, no. 3 (2008): 258-265.
[31] Ibid.
[32] Ibid.
[33] For example: Damien Cave, "Harsh Review of Restoration In Everglades," *The New York Times*, September 30, 2008. ; Michael Grunwald, "A Rescue Plan, Bold and Uncertain: Scientists, Federal Officials Question Project's Benefits for Ailing Ecosystem," *Washington Post*, June 23, 2002. ; Lance Gunderson and Stephen S. Light, "Adaptive Management and Adaptive Governance in the Everglades Ecosystem." *Policy Sci* 39 (2006): 323-334.
[34] Yin, *Case Study Research.* ; George and Bennett, *Case Studies and Theory Development*.
[35] Marjory Stoneman Douglas, *The Everglades: River of Grass* (Coconut Grove, FL: Hurricane House Publishers, 1947), 5.
[36] Genskow and Born, "Organizational Dynamics of Watershed Partnerships," 62.

# CHAPTER 4

# SOUTH FLORIDA WATERSHED AND THE EVERGLADES

This chapter is the first of three chapters that provide background information and governance and environmental chronologies that aid in interpretation of the dissertation's findings in Chapters 7-9. This chapter describes the South Florida watershed and its Everglades in their historic (natural) and developed conditions. The chapter then details the environmental and governance events, according to four major phases, which moved governance towards a more holistic, i.e., watershed or ecosystem, approach. Governance at the watershed level was influenced by activities to address the phosphorus and Shark Slough flow regime threats (as well as other ecological threats and concerns), and watershed governance in turn affected, or had the potential to affect, the two threats. These cross-scale connections are especially important since watershed level governance was often achieved through collaborative processes. An overview of the major environmental and governance events at the watershed level is provided in Table 3 at the end of the chapter.

## 4.1 South Florida Watershed and the Everglades

### 4.1.1 Historic Watershed

The South Florida watershed was once an ecologically productive and globally unique expanse of wetlands, lakes, and estuaries.[1] The watershed spanned the Kissimmee Chain of Lakes, the Kissimmee River valley, Lake Okeechobee, Big Cypress Swamp, the

Everglades, the Eastern Coastal Ridge, Ten Thousand Islands (including Whitewater Bay), and Florida Bay (shown in Figure 2). The enormous size of the wetlands was a result of an extremely low, flat terrain and high rainfall, with most delivered during the rainy season from May to October. The watershed's expanse and flatness moderated the weather extremes, providing wide, shallow, slowly flowing water (sheet flow), especially in the Everglades, that enlarged and shrank in a fairly regular manner.

The historic Everglades landscape was wet sawgrass plains in the northern part and a flow-oriented "ridge and slough" pattern in the central and southern parts, where sawgrass and "tree islands" vegetated the ridges, and the sloughs had deeper, swifter water with water lilies. The hydrologic and vegetative cycles combined to deposit layers of organic soils, with the deepest soils located just south of Lake Okeechobee. The Everglades supported a productive food chain based on periphyton, a complex mix of algae and other microorganisms that attaches to submerged surfaces. Historic Everglades wildlife included large colonies of wading birds, endemic species such as the Everglades snail kite and Cape Sable seaside sparrow, and other iconic species including alligators and the Florida panther.

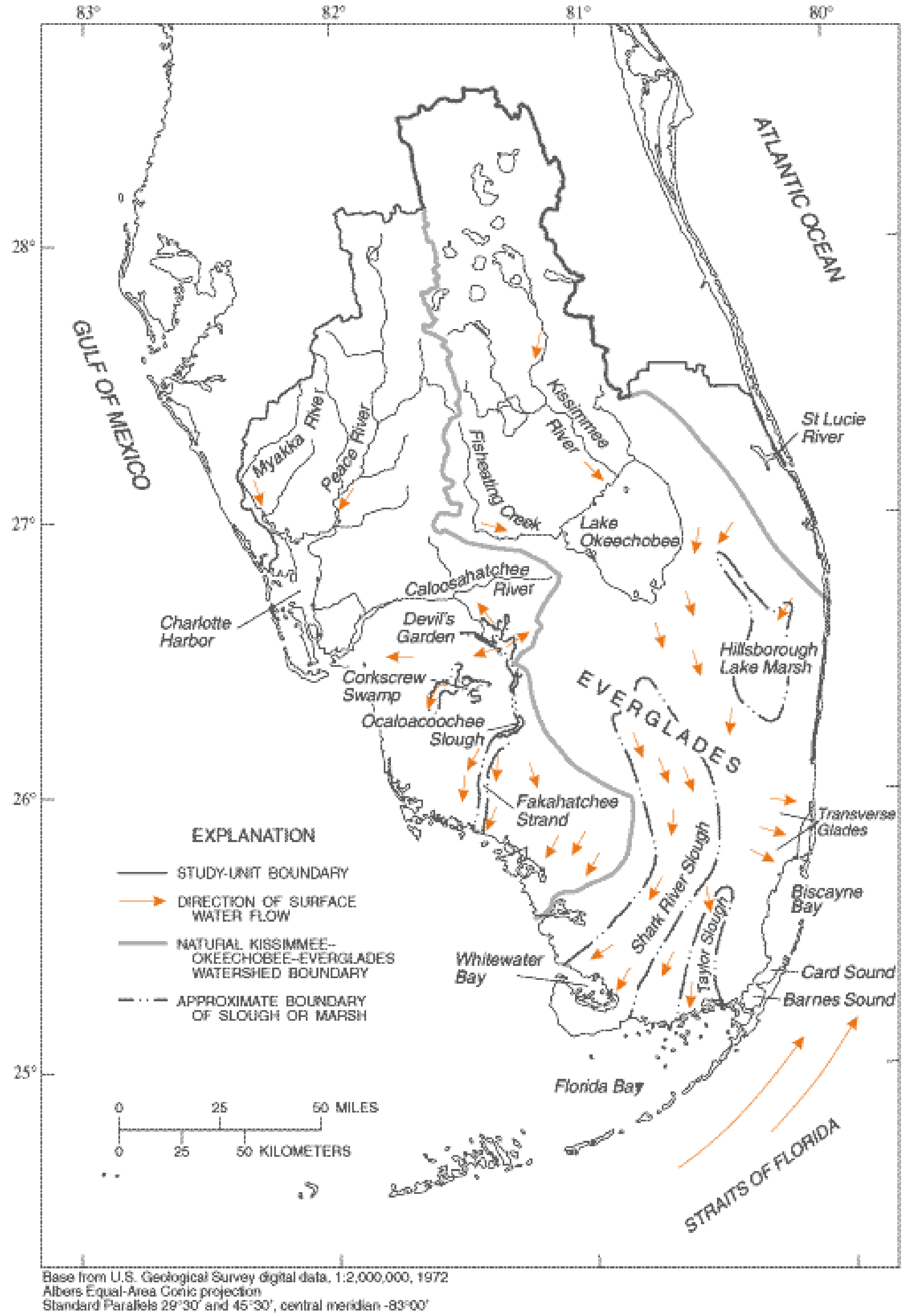


Figure 2 Historic South Florida Watershed. Source: U.S. Geological Survey, http://en.wikipedia.org/wiki/Everglades, accessed on August 14, 2009

4.1.2 Modification of the Watershed

Decades of intensive development dramatically reduced the wetlands and degraded the remaining portions, as well as damaged areas that were not previously connected to the basin. Large-scale human modification of the Everglades and larger South Florida watershed began in the early 1900s when settlers built canals and levees to drain land for agricultural development and communities, to control flooding, and to deliver water supplies.[2] The first major infrastructure projects were canals connecting Lake Okeechobee with the east and west coasts (to the St. Lucie and Caloosahatchee estuaries, respectively), and with the "lower east coast" using the four major transverse glades cutting through the Eastern Coastal Ridge (see Figure 3 for these and other modifications).[3] Additionally, a dike was constructed around the southern rim of Lake Okeechobee, and the Tamiami Trail highway cut across the southern Everglades in the 1920s. The first partnership between the federal and state governments for construction of the water management infrastructure in South Florida occurred in response to failure of the Lake Okeechobee dike in 1928 that killed close to 3,000 people and caused extensive property damage.

During the droughts of the 1940s, several consequences of Everglades drainage became apparent, including soil destroying fires and saltwater intrusion into coastal urban water sources due to lack of aquifer recharge. The 1940s also saw flooding of east coast urban areas. These problems prompted authorization of the massive Central and Southern Florida (C&SF) Project in 1948. Less than a year earlier in 1947, Congress designated the southern Everglades as Everglades National Park. The U.S. Army Corps of Engineers constructed the project during the 1950s and early 1960s, and the newly titled Central and

Southern Florida Flood Control District operated it.[4] The C&SF Project included a long north-south levee that hydrologically separated a substantial portion of the eastern Everglades and made it available for development. The C&SF Project also created large, shallow water impoundments, the Water Conservation Areas (WCAs), covering the entire central Everglades. The eastern portions of the WCAs had high water seepage into the surficial Biscayne Aquifer, and thus these areas were not routinely used for water storage. The C&SF Project furthermore enhanced the water management infrastructure in the historic northern Everglades to create the Everglades Agricultural Area (EAA). The improvements led to expansion of farming in this area, especially of sugarcane. The last major development of the C&SF Project occurred in the late 1960s and 1970s with construction of the Everglades National Park-South Dade Conveyance system in the East Everglades in order to provide water supply and flood protection for agriculture in the area, as well as water deliveries to the park's eastern border.[5] Overall, the water management infrastructure enabled economically significant agriculture in the EAA and East Everglades and rapid growth of the Lower East Coast urban population that reached 5.6 million people by 2005.[6]

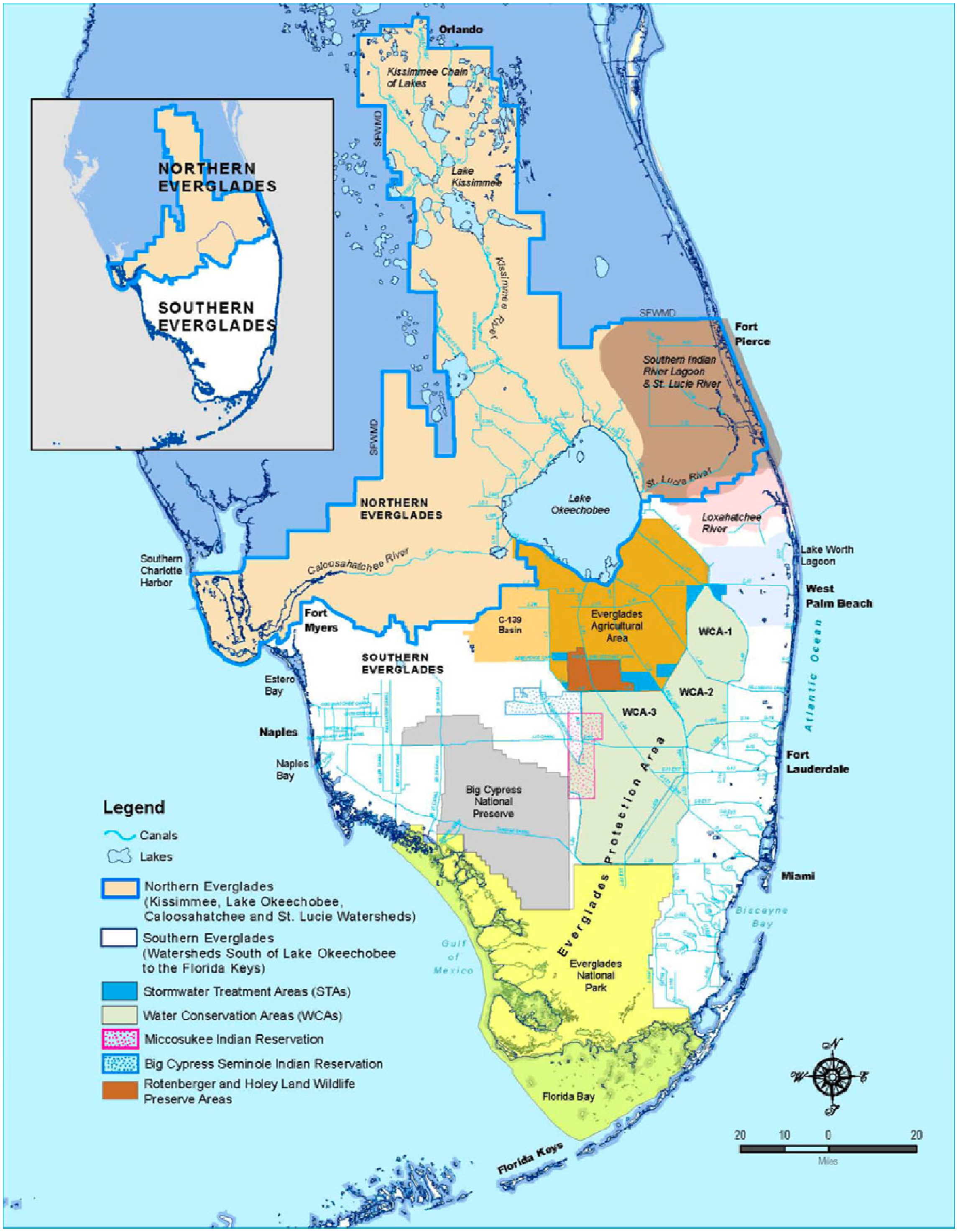


Figure 3 Current South Florida Watershed. Source: South Florida Water Management District, South Florida Environmental Report 2008[7]

The remaining Everglades, consisting of the Water Conservation Areas and Everglades National Park, is less than half its historic area and is highly degraded. Disruptions in water regime have caused loss of the remaining Everglades' ridge and slough landscape pattern. The timing of the managed water regime has often disagreed with the natural patterns upon which wildlife adapted. The stagnant water in the WCAs has lower levels of dissolved oxygen, and inflows to the Everglades are nutrient enriched, causing conversion of periphyton to a less productive algae and the replacement of sawgrass with cattails. The limiting nutrient is phosphorus, for which the major source is sugarcane farming in the EAA, due to fertilizer use, soil subsidence, and the biomass growing in extensive canal networks within the farms.[8] Various other "pollution" threats impact the Everglades, including invasive plant and animal species, and airborne mercury contamination. The overly dry conditions in some parts have caused substantial soil subsidence.[9] As an indicator of ecological degradation, wading bird populations in the Everglades are at one-tenth their historic levels, and scores of species are imperiled, including the Everglades snail kite and Cape Sable seaside sparrow.

Development of the South Florida watershed has caused problems extending beyond the Everglades, especially damaging flows released from Lake Okeechobee to the east and west coast estuaries (the St. Lucie/Indian River Lagoon and the Caloosahatchee estuaries). Moreover, the water management infrastructure failed to meet the utilitarian needs of South Florida development, primarily water supply for growing urban populations. And, the combined water management and agricultural land use in the Everglades Agricultural Area depleted the soil, making current agricultural practices (including sugar farming) unsustainable.[10]

## 4.2 South Florida and Everglades Governance

Organized efforts to protect and restore ecological values of the Everglades and larger South Florida watershed (or ecosystem) date back to the early 1900s.[11] The century-plus of ecosystem-level protection and restoration efforts had four phases: establishing protected areas amid intensifying water infrastructure (1902-1965), coordinating piecemeal restoration and the rise of collaboration (1965-1992), collaborative regional water resources planning (1992-2000), and implementing regional plans (2000-Present). The first ecosystem level collaborative process occurred during the second phase, and each phase since this time had different forms of collaboration. Appendix C provides more details about the ecosystem-level collaborative processes.

### 4.2.1 Establishing Protected Areas Amid Intensifying Water Infrastructure

In 1902 American conservation history was made in the Everglades when the Audubon Society successfully fought to protect wading birds from feather hunters (and national and state/regional Audubon groups remain active in Everglades governance today). A few years later in 1905, it was first suggested that an Everglades national park be created. At this time there were also a few naturalists who warned of the likely effects of Everglades drainage on its wildlife and soil, but these warnings went unheeded.[12]

The earliest organized initiative for Everglades ecosystem protection was the movement to create the national park. The effort began in 1916 with the protection of Royal Palm State Park, a large tree island (or hammock) in the southern Everglades. The National Park Service proposed the national park in 1923, but it took the advocacy of a passionate preservationist, Ernest Coe, for it to gain momentum. Coe left the movement over a dispute of the park's boundaries, and Spessard Holland, a state senator and then governor, took the lead. Holland promoted the national park because soil studies showed that the southern Everglades could not support agriculture, and he saw alternative value for tourism and the partnership it created with the federal government (Holland was also promoting the Central and Southern Florida Project). At the same time, Marjory Stoneman Douglas published *The Everglades: River of Grass*, a book that elevated the plight of the Everglades by providing an eloquent historical and scientific account of the Everglades ecosystem and issuing a plea for reversal of the degradation underway.[13] Everglades National Park was designated in 1947. Its original boundary, however, excluded the East Everglades, including the northeast portion of Shark Slough, to allow for development.

The C&SF Project was authorized in 1948. The origin of the C&SF Project was the 1943 Everglades Drainage District recommendation for Water Conservation Areas (WCAs) and a 1944 report by an Advisory Committee to the District that provided a general plan to address excess drainage (resulting in soil loss and fires), flood control, and water storage. Holland and the District gained political support by promising to spread the benefits of the C&SF Project to as many stakeholders as possible, including environmental interests (a strategy that was later achieved through collaborative processes). Even Douglas supported the project (which she later regretted). The C&SF Project received federal approval after storms flooded the east coast urban areas, demonstrating the flood protection need for the WCAs.[14] Governance leaders gave the Florida Game and Fresh Water Fish Commission responsibility for managing two of the

WCAs in order to generate sportsman opposition to any development threats to these areas, and the other WCA became the Loxahatchee National Wildlife Refuge under the management of the U.S. Fish and Wildlife Service. A local newspaper editor Ernest Lyons advocated that the state restore the historic Everglades flow way for natural flood control, but this view was ignored.

Also contributing to institutional stewardship of the Everglades are two Native American tribes, the Miccosukee and the Seminole. These tribes arrived in South Florida in the mid 1850s in order to escape federal resettlement initiatives and the Seminole Wars. The Miccosukee fled into the deepest parts of the Everglades and now refer to the Everglades their "mother." Both tribes have perpetual leases for tribal lands in the Everglades and Big Cypress Swamp (see Figure 3). The Miccosukee Tribe has been a staunch litigator on behalf of ecological protection of the central Everglades, where the tribe's lands are located.

### 4.2.2 Coordinating Piecemeal Restoration and the Rise of Collaboration

Although the C&SF Project addressed some environmental issues, it ultimately accelerated ecological degradation of the Everglades and other areas of the watershed. As the many ecological problems became apparent, piecemeal restoration efforts arose along with the beginnings of a holistic ecological perspective, thus resulting in coordination of the piecemeal efforts (but little comprehensive, ecosystem-level planning for restoration at this time).

Upon completion of the C&SF Project in early 1960s, Everglades National Park complained of insufficient inflow from the WCAs and spent the next two decades fighting for incremental changes to the water delivery schedule. The U.S. Army Corps of Engineers first responded with a "Survey-Review" study of the C&SF Project in 1965, but the main outcome was operational changes to meet growing urban water supply needs.[15] Also during the late 1960s economic boosters proposed a large "jetport" (i.e., airport) to be located adjacent to the Everglades in Big Cypress Swamp. The jetport threat galvanized opposition and led to the creation of the Everglades Coalition, a broad-based alliance of national and regional environmental organizations (the Everglades Coalition remains prominent). At this time, Marjory Stoneman Douglas founded the advocacy group Friends of the Everglades. Environmental interests defeated the initiative and then focused their attention on attaining federal protection for the swamp, which was achieved in 1973.

In 1971 scientists with the Central and Southern Florida Flood Control District noted ecological changes from excess nutrients in the WCAs downstream of the EAA, although this received little attention. Instead, environmental activists were focused on the impacts of channelization of the Kissimmee River (completed in 1971 as part of the C&SF Project) and signs of excess nutrients in Lake Okeechobee, presumably from the cattle ranches in the Kissimmee Valley. The immediate call was to restore the Kissimmee River's natural wide meandering.

The problems in the upper watershed, combined with a severe drought affecting the entire region, led to the first ecosystem level collaborative process, the Governor's Conference on Water Management in South Florida.[16] The Conference resulted in several landmark state environmental laws concerning water management, growth management, and land conservation. The Florida Water Resources Act of 1972 created the South

Florida Water Management District (formerly the Flood Control District) with jurisdiction corresponding to the South Florida watershed and having environmental regulatory authority for water resources. In 1972 the District developed its first regional water plan, emphasizing infrastructure upgrades to meet water needs, even though public workshops favored conservation and growth management, and the new Bureau of Comprehensive Planning recommended restoration of the natural system for water storage.[17] Florida's Environmental Reorganization Act of 1975 created the Department of Environmental Regulation (DER) with oversight of District water policies.

In 1980 ecologist Arthur (Art) Marshall expanded the watershed restoration vision to include the Everglades and presented his "Marshall Plan" to the District's Governing Board.[18] Marshall had been a strong watershed advocate, including as a leader in the Governor's Conference on Water Management a decade earlier. The Marshall Plan proposed capturing the water that was being sent to sea in the name of flood control and sending it to the wildlife management areas in the north-central Everglades (i.e., the Holey Land and Rotenberger tracts shown in Figure 3), with gradual reclamation of wetlands moving northward into the EAA as soil subsidence rendered it unfit for cultivation.[19] The Marshall Plan also sought to restore sheet flow across the central and southern Everglades.[20] Marshall advocated his plan by ascribing water supply advantages such as wetlands creating more local rainfall and therefore guarding against droughts. The Marshall Plan did not immediately persuade the District to restore the Everglades, but it planted the notion that there was substantial opportunity to modify the C&SF Project in support of ecological and other social values.

In the following few years, negative national publicity forced Governor Bob Graham to seriously consider the Marshall Plan, Kissimmee River restoration, and Everglades National Park's drive to restore Northeast Shark Slough (presented to the District and Corps in 1983). Governor Graham created the first watershed-level coordinating group, the Kissimmee-Lake Okeechobee-Everglades Coordinating Council, to oversee the governor's Save Our Everglades program consisting of the various ecological restoration projects already underway across South Florida.[21] Save Our Everglades continued until 1990, adding restoration programs and issues as they were independently created. In 1986 Governor Graham revived the dormant Everglades Coalition and organized its first annual conference in order to strengthen the environmental voice in ecosystem governance. Also during this time, Graham recommended that the state provide greater institutional support for collaborative environmental dispute resolution, and the legislature formed the Florida Conflict Resolution Consortium (originally named the Florida Growth Management Conflict Resolution Consortium) in 1987.[22] Through the years, the Florida Conflict Resolution Consortium provided process design and professional facilitation services for several Everglades ad hoc and ecosystem level collaborative processes. In addition, as a sign of Governor Graham's early interest in collaborative processes, he led the legislature to amend state law in 1979 to require collaborative processes, i.e., Resource Planning and Management Committees (RPMCs), to help build support for the state's program of designating environmentally sensitive Areas of Critical State Concern.[23] During the 1980s, Graham convened a number of ad hoc collaborative processes in South Florida (with some being RPMCs), as did the District.[24]

In the late 1980s the impacts of excess phosphorus from the Everglades Agricultural Area on the central Everglades finally gained prominence, and the District began development of a plan (the Everglades SWIM Plan) to reduce phosphorus and improve the flow regime in the Everglades. The plan was a response to the state's watershed-based approach to water quality improvement, the Surface Water Improvement and Management (SWIM) Act. The EAA phosphorus issue became very contentious after the federal government filed a lawsuit against the state and District, and the agencies and stakeholder groups spent several years in litigation and mediation. The result was a more fully developed watershed-based phosphorus reduction plan, the Everglades Program, required by the Everglades Forever Act of 1994. Save Our Everglades never included the Everglades phosphorus reduction efforts.

### 4.2.3 Collaborative Regional Water Resources Planning

The 1990s was a decade devoted to collaborative regional water resources planning under the District's Lower East Coast Regional Water Supply Plan (LEC Plan) and the Corps' C&SF Project Restudy. Governance of the two threats of interest for this dissertation, i.e., EAA phosphorus and disruptions of the Shark Slough flow regime, continued somewhat independently of the regional water resources planning initiatives. The details of governance of the two threats are provided in Chapters 5 and 6.

The Florida Water Resources Act of 1989 and a drought led the District to initiate development of LEC Plan in 1990, the purpose of which was to ensure adequate water for development and the environment over the next twenty-year period.[25] The planning process included the formation in 1992 of the LEC Plan Advisory Committee composed of urban, agricultural, and environmental interests. In 1995 the LEC Plan initiative combined with the C&SF Project Restudy.

The Restudy was born from the growing belief that significant modification of the C&SF Project was needed for ecological improvement across the watershed, and that a major planning effort could also meet other objectives, especially urban water supply, thereby gaining political support.[26] The technical foundation for the C&SF Project Restudy was a modest Corps "restudy" in 1980-84 that supported development of the District's South Florida Water Management Model.[27] Everglades National Park scientists began using the model to predict the flow effects of canal and levee removal. In the late 1980s, the idea of a major C&SF Project Restudy gained strength due to the vision and advocacy of Jim Webb of the Wilderness Society. In 1989 ENP and the District sponsored the first Everglades Symposium scientific conference that formed the ecological foundation of a vision of a restored Everglades.[28] And simultaneously, as a result of advocacy for Kissimmee River restoration, the federal Water Resources Development Act (WRDA) of 1990 explicitly stated that environmental protection was a purpose of the C&SF Project and authorized the Corps to conduct environmental restoration projects. In 1992 Congress authorized the C&SF Project Restudy.[29]

Webb convinced the new U.S. Secretary of the Interior in the Clinton Administration, Bruce Babbitt, of the Restudy's importance, and Babbitt presented his vision of a collaborative, whole ecosystem approach at the annual Everglades Coalition Conference in early 1993. To aid this approach, especially in light of the divisiveness and gridlock that had occurred over the Everglades phosphorus issue, Babbitt formed the federal South Florida Ecosystem Restoration Task Force and Interagency Working Group in 1993.[30] In 1994 Governor Lawton Chiles created the Governor's Commission for a Sustainable South Florida (GCSSF) to provide for regional governance coordination with greater representation of state and local interests, and to show state and local support for initiatives requesting federal funding.[31] Based on the lackluster performance of the earlier "restudy," the Corps also recognized the political capacity building value of the collaborative approach.[32] When the C&SF Project Restudy was in full swing during 1996-98, the Restudy Team consisted of over 100 participants, mostly technical experts, representing numerous agencies, local governments, and the tribes. Furthermore, the Water Resources Development Act of 1996 instructed the C&SF Project Restudy to receive guidance from the Task Force/Working Group and the GCSSF. The C&SF Project Restudy and the resulting Comprehensive Everglades Restoration Plan, gained additional political support during the 1996 and 2000 presidential elections because of Florida's "swing state" status.[33]

When the C&SF Project Restudy published its recommended alternative in 1998, Everglades National Park concluded that it would not ensure restoration of the Everglades, and a panel of nationally recognized ecologists concurred. The Comprehensive Everglades Restoration Plan included projects to reduce barriers to sheet flow, improve natural timing of water deliveries, and reduce flow regime extremes, but they had long implementation time horizons and lacked full institutional assurances.[34] The plan promised only slight increases in average Everglades flow volumes. Other critics charged that the Comprehensive Everglades Restoration Plan (CERP) was more of a water supply plan for the urban areas.[35] Indeed, the Lower East Coast Regional Water Supply Plan, which was finalized in 2000, relied heavily on CERP to provide additional sources of water to the growing population.[36] Moreover, CERP was not well coordinated with water quality issues, thus leading to the possibility that ecological concerns and state water quality law would prohibit the new flows captured by CERP projects.[37] To address the concerns and to encourage environmentalists to support CERP, the Corps promised to use adaptive management for CERP implementation. Additionally, the Task Force contracted with the National Academy of Sciences to form the Committee on the Restoration of the Greater Everglades Ecosystem (CROGEE) to independently evaluate CERP's ecological progress.[38]

The Water Resources Development Act of 2000 signed CERP into federal law and authorized several of its projects. The assumption was that future WRDAs, expected about every two years, would continue the funding over the several decades needed for full CERP implementation.

### 4.2.4 Implementing Regional Water Resource Plans

During implementation of the LEC Plan and CERP, ecosystem level coordinating groups continued to function, albeit in a different form at the state/regional level. Upon Governor Jeb Bush's election in 1999, he disbanded the Governor's Commission for a Sustainable South Florida and replaced it with his Governor's Commission for the Everglades (GCE). The GCE discussed CERP implementation among a few other issues, disbanded in 2001, and arranged for the District's Governing Board to form a stakeholder committee, the Water Resources Advisory Commission (WRAC), to take on the role of the former governor commissions.[39] As an advisory body to the District Board, the WRAC focused on water supply planning and other water management issues of primarily District concern.[40] The South Florida Ecosystem Restoration Task Force and Working Group continued to facilitate interagency coordination and provide input to CERP implementation.

With finalization of the LEC Plan and CERP in 2000, the District began developing policy mechanisms to protect water for the natural system. In 2001, as required by state law, the District established Minimum Flows and Levels (MFLs) for the Everglades, with the recovery strategy in the event of violation being the implementation of the LEC Plan and CERP. In 2003 the District began considering water reservations for natural areas including the Everglades. Water reservations are a policy tool authorized by state law that set aside water for the natural system and make it unavailable for consumptive uses. Water reservations are potentially more institutionally protective than MFLs and will be the mechanism for allocating water captured by CERP projects.[41] In 2007, the District Governing Board, following WRAC leadership, approved a Regional Water Availability Rule to greatly limit future water withdrawals dependent upon the Everglades for recharge, since the District had been authorizing water allocations that were not consistent with the Everglades MFLs. The District's regulations to institute water reservations for the Everglades, however, remained elusive up to 2009.[42]

With regard to CERP implementation, the Corps and District, as co-sponsors, oversaw the work of its interagency teams: RECOVER (Restoration Coordination and Verification) at the ecosystem level and Project Delivery Teams for the projects. The first few years of CERP implementation consisted of developing the Corps' Programmatic Regulations and other program-level agreements.[43] By 2004 it was apparent that the federal government was not able to honor its commitment to provide half the funding for

CERP (due to lack of WRDAs from 2000 to 2007). The District and state thus negotiated with the Corps to create the Acceler8 program to fund and speed implementation of eight projects, half of which had significant water storage functions.[44] As a further adaptation, the District and state began to look for other water supply sources to meet the growing demand, especially alternative sources such as brackish water, and the LEC Plan Update published in 2007 reflected the change in strategy.[45] In 2008 the District announced its Comprehensive Water Conservation Program to "[meet] the growing demands on South Florida's limited water supply," primarily by instituting year-round restrictions on landscape irrigation.[46]

In 2006 the new National Academy of Sciences oversight panel, the Committee on the Independent Scientific Review of Everglades Restoration Progress, published its first biennial evaluation of CERP that noted delays in projects primarily serving ecological restoration objectives.[47] The committee's second evaluation reported in 2008 further stressed that Everglades restoration was "making only scant progress toward achieving its goals," and, "To begin reversing decades of decline, managers should address complex planning issues and move forward with projects that have the most potential to restore the natural ecosystem."[48]

Table 3 chronologically lists the major events in South Florida watershed governance. For each event, the table indicates the primary type of governance process involved or resulting (collaborative, political, bureaucratic, judicial, or scientific), or whether it was an environmental change.

Table 3 Chronology of Major Events for the South Florida Watershed

| Date | Event | Type |
|---|---|---|
| 1910s | Large-scale Everglades drainage and development initiated | E |
| 1947 | Everglades National Park established | B |
| 1948 | Central and Southern Florida Project authorized | B |
| 1965 | Water Conservation Areas completed | E |
| 1965 | Corps' Survey-Review of the C&SF Project begun | C |
| 1968 | Jetport defeated and Everglades Coalition created | P |
| 1971 | EAA phosphorus impacts in WCAs observed | B |
| 1971 | Activist attention on Kissimmee River and Lake Okeechobee | P |
| 1971 | Governor's Conference on Water Management in South Florida | C |
| 1972 | South Florida Water Management District created | B |
| 1975 | Florida Department of Environmental Regulation created | B |
| 1979 | Resource Planning and Management Committees required | C |
| 1980 | Marshall Plan presented to District's Governing Board | P |
| 1980 | First C&SF Project "restudy" initiated | B |
| 1983 | Save Our Everglades initiative begun | C |
| 1986 | Everglades Coalition revived | P |
| 1987 | Florida Conflict Resolution Consortium created | C |
| 1988 | Everglades SWIM Plan planning initiated | B |
| 1988 | Federal phosphorus lawsuit initiated | J |
| 1989 | First Everglades Symposium | S |
| 1990 | Lower East Coast Regional Water Supply Plan planning initiated | B |
| 1992 | C&SF Project Restudy authorized | B/C |
| 1993 | South Florida Ecosystem Restoration Task Force and Working Group created | C |
| 1994 | Governor's Commission for a Sustainable South Florida created | C |
| 1994 | Everglades Forever Act passed | P |
| 1995 | LEC Plan and Restudy combined | B |
| 1999 | Committee on the Restoration of the Greater Everglades Ecosystem created | P/S |
| 1999 | Governor's Commission for the Everglades created | C |

Table 3 (continued)

| **Date** | **Event** | **Type** |
|---|---|---|
| 2000 | Comprehensive Everglades Restoration Plan authorized | B |
| 2000 | LEC Plan finalized | B |
| 2001 | Water Resources Advisory Commission created | C |
| 2004 | Acceler8 initiated | B |
| 2007 | District's Regional Water Availability Rule passed | B |
| 2007 | LEC Plan Update issued | B |

Type: C – collaborative process, P – political process, B – bureaucratic process, J – judicial process, S – scientific process, E – environmental change

This chapter provided watershed and Everglades level views of environmental and governance events, and this information provides a foundation for understanding the phosphorus and Shark Slough flow regime threats and their governance presented in the next two chapters.

### 4.3 Notes

[1] Steven M. Davis and John C. Ogden, eds., *Everglades: The Ecosystem and Its Restoration* (Delray Beach, FL: St. Lucie Press, 1994). ; Thomas E. Lodge, *The Everglades Handbook: Understanding the Ecosystem*, 2nd edition (Boca Raton, FL: CRC Press, 2005). ; Curtis J. Richardson, *The Everglades Experiments: Lessons for Ecosystem Restoration* (New York, NY: Springer, 2008).
[2] Nelson Manfred Blake, *Land into Water—Water into Land: A History of Water Management in Florida* (Tallahassee, FL: University Presses of Florida, 1980). ; Stephen S. Light and J. Walter Dineen, "Water Control in the Everglades: A Historical Perspective." In *Everglades: The Ecosystem and Its Restoration,* edited by Steven M. Davis and John C. Ogden (Boca Raton, FL: St. Lucie Press, 1994). ; Ted Levin, *Liquid Land: A Journey through the Florida Everglades* (Athens, GA: University of Georgia Press. 2004). ; Matthew C. Godfrey, "River of Interests: Water Management in South Florida and the Everglades, 1948-2000" (U.S. Army Corps of Engineers, 2006). ; Michael Grunwald, *The Swamp: The Everglades, Florida, and the Politics of Paradise* (New York, NY: Simon & Schuster, 2006).
[3] These canals are named Miami, North New River, Hillsboro, and West Palm Beach.
[4] The agency had formerly been called the Everglades Drainage District.
[5] Joel I. Wagner and Peter C. Rosendahl, "History and Development of Water Delivery Schedules for Everglades National Park through 1982" (South Florida Research Center, National Park Service: Homestead, Florida, 1987).
[6] South Florida Water Management District, "LEC Plan Update 2005/2006, Executive Summary" (2006), http://www.sfwmd.gov/portal/page?_pageid=1874,4166676,1874_4166342:1874_4167053&_dad=portal&_schema=PORTAL (accessed August 20, 2009).
[7] South Florida Water Management District and Florida Department of Environmental Protection, "2008 South Florida Environmental Management Report. Volume 1: The South Florida Environment," https://my.sfwmd.gov/pls/portal/docs/PAGE/PG_GRP_SFWMD_SFER/PORTLET_SFER/TAB2236041/VOLUME1/vol1 (accessed July 18, 2008).
[8] Richardson, *The Everglades Experiments*.
[9] The high organic content of the soil leads to oxidation when exposed to the air. The organic soil can also burn when dry.
[10] G. H. Snyder, and J. M. Davidson, "Everglades Agriculture: Past, Present, and Future." In *Everglades: The Ecosystem and its Restoration*, edited by Steven M. Davis and John C. Ogden (Boca Raton, FL: St. Lucie Press, 1994).
[11] Michael Grunwald, *The Swamp*, provided much of the information about early Everglades politics. Other significant sources are listed in note 2.
[12] The naturalists were John K. Small and Charles Torrey Simpson.
[13] Marjory Stoneman Douglas, *The Everglades: River of Grass* (Coconut Grove, FL: Hurricane House Publishers, 1947).
[14] The federal government was not interested in paying for the WCAs for the purpose of water supply to enable Florida development, but it would act to prevent flooding.

[15] U.S. Army Corps of Engineers, "Survey-Review Report: Water Resources for Central and Southern Florida" (1968).
[16] Governor's Conference on Water Management in South Florida, "Statement to Governor Reubin O'D. Askew from the Governor's Conference on Water Management in South Florida" (1971).
[17] In 1978 the state issued its water use and water quality plans, and in 1979 is first State Comprehensive Plan. The plan recommended historic surface and groundwater levels and a natural hydroperiod. The state legislature accepted the plan as advisory rather than policy.
[18] Arthur R. Marshall, "A Critique of Water Management in South Florida" (November 20-21, 1980), http://everglades.fiu.edu/marshall/FI06011110/index.htm (accessed on August 20, 2009).
[19] The Florida Game and Fresh Water Fish Commission began leasing the Holey Land tract to establish a portion of the Everglades Wildlife Management Area. The state purchased the Rotenberger tract in 1975 through Environmentally Endangered Lands Program.
[20] WCA 3A, WCA 3B, and Northeast Shark Slough using culverts along levees and highways, blockage of canals, and opening the S-12 gates at Everglades National Park
[21] The projects were restoration of the Kissimmee River, the Holey Land and Rotenberger tracts, and flows to Everglades National Park. Kissimmee River – Lake Okeechobee – Everglades Coordinating Council. "Annual Summary Report" (1986).
[22] The Florida judicial system paralleled the legislative and administrative branch interest in collaboration. The first court based alternative dispute resolution program occurred in Dade County in 1975. The state's Supreme Court established the Florida Dispute Resolution Center in 1986, and the court established a program for court annexed mediation in the circuit and county courts. In 1987, the state legislature allowed civil trial judges to refer any civil case to mediation or arbitration. Michael Elliott, Bruce Stiftel, Kathryn Frank, Severine Mayere, Robert M. Jones, and Thomas Taylor, "Societal Effects of Collaborative Decision-making in Florida: The Impact of Environmental Conflict Resolution Institutions on Public Choice, Civic Culture and Environmental Management Systems" (Unpublished Draft for the William and Flora Hewlett Foundation, 2002).
[23] The original act designating the Areas was the 1972 Environmental Land and Water Management Act that required regional review of large-scale development. James C. Nicholas, "State and Regional Land Use Planning: The Evolving Role of the State." *St. John's Law Review*, 1999.
[24] Governor Graham created RMPCs for the East Everglades and Kissimmee River. Graham also convened two interagency committees to address deer management in the WCAs and a proposal for an airport in WCA 3B. Graham's leadership permeated the South Florida Water Management District with his appointments to the District's Governing Board in 1985, and the District built its internal capacity for collaboration and ecosystem management. Patricia A. Bidol and Stephen S. Light, "Innovative Approaches to Managing Water Crises: Alternative Dispute Resolution for Lake Okeechobee" (South Florida Water Management District, no date).

[25] The Water Resources Act contained guidelines for regulating water allocation including consumptive use permitting, reservation of water, minimum flows and levels, and water shortage program.
[26] As part of the LEC Plan process, modeling determined that existing restoration projects (e.g., Modified Water Deliveries) would achieve "less than a quarter" of the regional hydrological patterns necessary to meet ecological goals.
[27] In 1984 the District developed the first version of its South Florida Water Management Model.
[28] Davis and Ogden, *Everglades*.
[29] The Reconnaissance Phase occurred from 1993 to 94.
[30] Stuart Langton and Walter A. Rosenbaum, "Historical highlights of the South Florida Ecosystem Task Force" (Florida Center for Environmental Studies, 2000).
[31] Governor's Commission for a Sustainable South Florida, "Initial Report" (Coral Gables, Florida, 1995).
[32] Godfrey, *River of Interests*.
[33] During the 2000 election there was a dispute over whether to convert the Homestead Base near the Taylor Slough headwaters into a major airport serving the Miami area. The airport initiative was defeated. See: Grunwald, *The Swamp*.
[34] U.S. Army Corps of Engineers and South Florida Water Management District, "Central and Southern Florida Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" (1999), http://www.evergladesplan.org/pub/restudy_eis.cfm#mainreport (accessed January 30, 2006).
[35] Friends of the Everglades and the Sierra Club stating the plan was unacceptable, and Environmental Defense and the National Resources Defense Council threatened to sue the federal government. Grunwald, *The Swamp*.
[36] South Florida Water Management District, "2000 Lower East Coast Regional Water Supply Plan" (2000).
[37] South Florida Ecosystem Restoration Working Group, "Meeting Minutes" (various dates), http://www.sfrestore.org/wg/minutes.html (accessed August 20, 2009).
[38] CROGEE issued five reports and disbanded in 2004 when a new NAS oversight committee formed. The Government Accounting Office prepared additional CERP oversight reports. For example: General Accounting Office, "Comprehensive Everglades Restoration Plan: Additional Water Quality Projects May Be Needed and Could Increase Costs" (GAO/RCED-00-235. Washington, DC: GAO, 2000).
[39] Governor's Commission for the Everglades, "Meeting Minutes" (various dates), http://www.everglades.state.fl.us/ (accessed March 2, 2007). ; South Florida Water Management District, "Water Resources Advisory Commission," https://my.sfwmd.gov/portal/page?_pageid=834,1804313&_dad=portal&_schema=PORTAL&navpage=home (accessed June 15, 2006).
[40] Water Resources Advisory Commission, "Meeting Minutes" (various dates), https://my.sfwmd.gov/portal/page?_pageid=834,1804313&_dad=portal&_schema=PORTAL&navpage=home (accessed on August 20, 2009).

[41] Joel VanArman, "Minimum Flows and Levels Priority List and Schedule." In "2007 South Florida Environmental Report" (South Florida Water Management District, 2007), 3-5.

[42] South Florida Water Management District, "2009 South Florida Environmental Report. Executive Summary," https://my.sfwmd.gov/portal/page?_pageid=2714,14424181,2714_14424223&_dad=portal&_schema=PORTAL (accessed August 20, 2009).

[43] U.S. Army Corps of Engineers and South Florida Water Management District. "Comprehensive Everglades Restoration Plan: Programmatic Regulations: Six Program-wide Guidance Memoranda. Revised Final Draft," 2007. http://www.evergladesplan.org/pm/pm_docs/prog_regulations/072707_prog_regs_rev_final_dft_gm.pdf (accessed May 7, 2008).

[44] Governor's Press Office, "Governor Bush Accelerates Restoration of America's Everglades," http://www.dep.state.fl.us/secretary/news/2004/oct/1014_01.htm (accessed on June 12, 2006).

[45] South Florida Water Management District, "LEC Plan Update 2005/2006, Executive Summary" (2006), http://www.sfwmd.gov/portal/page?_pageid=1874,4166676,1874_4166342:1874_4167053&_dad=portal&_schema=PORTAL (accessed August 20, 2009).

[46] South Florida Water Management District, "Water Conservation: A Comprehensive Program for South Florida" (2008).

[47] National Research Council, Committee on Independent Scientific Review of Everglades Restoration Progress, *Progress Toward Restoring the Everglades: The First Biennial Review* (Washington, DC: National Academies Press, 2006), http://www.csis.msu.edu/Publications/Restoring_the_Everglades_2006.pdf (accessed August 16, 2009).

[48] National Research Council, Committee on Independent Scientific Review of Everglades Restoration Progress, *Progress Toward Restoring the Everglades: The Second Biennial Review* (Washington, DC: National Academies Press, 2008).

# CHAPTER 5

# PHOSPHORUS CASE

This chapter presents an overview of progress to reduce the Everglades Agricultural Area phosphorus threat and details of the governance events that produced the progress. This chapter (along with the next chapter concerning the Shark Slough case) thus provides the background information for understanding the dissertation's main findings in Chapters 7-9.

The overview of restoration progress describes the historic northern Everglades, its agricultural development and phosphorus impacts to the remaining Everglades, and the major restoration projects and policies. The chronology of events is divided into four subsections according to significant progressions towards improved ecosystem management, primarily in terms of the protective tenet. For each subsection, a brief discussion of the role of collaborative processes is included. A table outlining the major events is provided at the end of the chapter.

## 5.1 Overview of Phosphorus Restoration Progress

### 5.1.1 Historic Northern Everglades and the Phosphorus Threat

The source of the phosphorus threat of concern for this dissertation is the Everglades Agricultural Area (EAA) (see Figure 3 for features discussed in this chapter). The EAA was formerly the northern third of the historic Everglades.[1] Tall sawgrass plains dominated the historic landscape because the phosphorus level (phosphorus is the limiting nutrient) was about 15 ppb in water flowing overland from Lake Okeechobee. By the time flow reached the central Everglades, phosphorus level had dropped to less than 10 ppb, and the ridge and slough landscape became predominant.[2]

Efforts to drain and farm the northern Everglades began as early at the late 1800s, and modification became complete with construction of the C&SF Project that created the Everglades Agricultural Area in the early 1960s.[3] Sugar farming was the main activity in the EAA. Farming in the EAA contributed excess phosphorus to water runoff through fertilizer application, soil oxidation, and vegetation growing in the extensive canal network serving the farms. The different sources contributed a variety of forms of phosphorus, the sum of which is "total phosphorus." Total phosphorus is composed of soluble reactive phosphorus, soluble unreactive phosphorus, and particulate phosphorus.[4] Soluble reactive phosphorus is the form readily available for uptake by organisms. Prior to restoration efforts, the concentration of total phosphorus in inflows to the Everglades from the EAA was a flow-weighted average of 170 ppb for the ten-year period from 1978 to 1988.[5] Soluble reactive phosphorus represented about 30% of total phosphorus (from 1978 to 2003).[6]

The excess phosphorus flowing into the remaining Everglades caused a number of problems. The excess phosphorus converted the periphyton microbial community (adhering to surfaces under water) that formed the basis of the food chain into a less ecologically beneficial algae. The excess phosphorus entered the soil and favored the growth of cattails rather than sawgrass, and the cattails were inferior wildlife habitat. Once phosphorus enters the soil, it continues to leach out and its presence is virtually irreversible. The impacts of excess phosphorus from the EAA are most significant along canals and downstream of water delivery gates, especially in WCA 2. Everglades National Park has detected the impact of excess phosphorus on periphyton several miles south of the water delivery gates along Tamiami Trail.

5.1.2 Phosphorus Restoration Progress

Governance required agriculture to implement non-burdensome source controls (best management practices (BMPs)), provided attractive buy-out options for farms leaving production, constructed STAs on purchased farms to treat EAA runoff, and conducted research into advanced technologies. In all, governance reduced the EAA phosphorus threat by about 80% and positioned itself for further reductions. In 2007 restoration efforts achieved between 20 and 120 ppb phosphorus annual flow-weighted averages for inflows to the Everglades via the constructed Stormwater Treatment Areas.[7] Alternatively, an ecological way to measure the phosphorus threat is in terms of acres of sawgrass converted to cattails per year. The South Florida Water Management District reported that sawgrass conversions to cattails in the most impacted WCA (WCA 2A) went from 2400 acres per year in the early 1990s to 800 acres per year in 2003.[8]

Achieving the 10 ppb total phosphorus limit to maintain the natural ecology will remain a challenge given the technical difficulty of reducing phosphorus to such a low level, competition for use of public lands by other restoration projects (e.g., water storage), and the potential increase in the phosphorus threat from changing land use of private property. By 2050 the soils in the southern half of the EAA will become too shallow for current sugar production practices and will be more suitable for cattle and urbanization.[9] Current land use laws in the area allow houses on 10-acre lots.

## 5.2 Phosphorus Governance

Phosphorus governance occurred in four phases: emergence of the phosphorus threat and governance attention; the federal water quality lawsuit and mediations; implementation of the Everglades Forever Act; and amendment of the Everglades Forever Act. The types of collaborative processes used and their impacts correspondingly changed with each phase. Collaborative processes during the first time period were largely technical expert panels focused on an interrelated issue, the eutrophication of Lake Okeechobee. Collaborative processes during the second period were mostly tied to effort to settle litigation and create an implementable plan. The third and fourth periods had ongoing collaborative processes, but they had relatively less impact on the phosphorus threat. Appendix A provides more details about the collaborative processes for this case.

### 5.2.1 Emergence of the Phosphorus Threat and Governance Attention

The District had management control of the Water Conservation Areas (WCAs) created in the early 1960s by the C&SF Project and thus slowly gained awareness of the phosphorus threat, the responsibility to reduce it, and the policy tools to do so. During this time period, collaborative processes played a tangential role in governing the EAA phosphorus threat, since they were focused on nutrient problems in Lake Okeechobee.

In 1971 District staff first noticed signs of eutrophication in the Everglades eutrophication, with the suspected cause being runoff from the Everglades Agricultural Area, in which farming, especially the sugar industry, had increased during the 1960s.[10]

Prior to this memo, there were no warnings of this potential effect of EAA development even though there was general awareness of the negative ecological impacts of excess nutrients on water bodies, including for Lake Okeechobee.[11] The same year Governor's Conference on Water Management in South Florida made vague reference to the need to maintain water quality in Everglades National Park, which is downstream from the WCAs.

In late 1972 an independent technical panel headed by Art Marshall, which was focused on the Kissimmee-Lake Okeechobee area, reported "a serious water quality problem" in one of the WCAs, with "8 to 10 inches of organic ooze blanketing about two thirds of its bottom."[12] Over the next few years, in response to a proposal that the wetlands be used to treat urban wastewater for reuse, the District and ENP conducted studies to determine the impact of nutrients on the Everglades. The studies found that small concentrations of nutrients modified the vegetation (and therefore the wetlands were unable to process the levels of pollutants found in the urban wastewater). Responding to growing awareness of eutrophication in the WCA, an internal District staff memo recommended that the District or another agency immediately develop water quality standards for discharges into District waters.[13] District staff also considered adding nutrient monitoring and runoff detention provisions to a new surface water management permit for a sugar grower, but they did not institute this approach.[14]

The latter half of the 1970s saw a substantial strengthening of state water quality law and regulatory authority that would eventually dictate Everglades phosphorus reduction. The state amended its Air and Water Pollution Control Act to contain a provision that for water bodies with the state's highest use classifications, including the

Everglades: “In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna.” This provision is known as the “narrative criterion” for nutrients and a main legal basis for the 1988 federal lawsuit against the state regarding the impact of phosphorus on the Everglades. Also during the mid-1970s the Environmental Reorganization Act created the Florida Department of Regulation (DER) and required the agency to develop a permitting program for point sources of water pollution, or delegate this authority to the water management districts.[15] Several years later the District began monitoring nutrients in EAA flows entering the WCAs. Further tightening water quality standards, in 1979 the state designated Everglades National Park and Loxahatchee National Wildlife Refuge (a WCA) as Outstanding Florida Waters, meaning that degradation of water quality beyond that level present at the time of designation was not allowed. The federal and state agencies signed a Memorandum of Agreement for the standards and a water quality monitoring program, including for phosphorus.

The emerging problem of excess phosphorus in the Everglades was overshadowed by the eutrophication of Lake Okeechobee caused by high nutrient loads from its tributary basins to the north of the lake, including the Kissimmee River valley. The first narrowly focused collaborative process in South Florida was the interagency technical panel created by the Florida Legislature in 1973, the Special Project to Prevent the Eutrophication of Lake Okeechobee.[16] The Special Project identified the main sources of nutrients to the lake and led in 1976 to the formation of the Coordinating Council on the Restoration of the Kissimmee River Valley and Taylor Creek-Nubbin Slough Basin to encourage the reduction of these sources. The Special Project was also a precursor to another technical panel formed in 1985, the Lake Okeechobee Technical Advisory Council (LOTAC I), which evolved in 1987 to address the Everglades phosphorus threat.

The Special Project to Prevent the Eutrophication of Lake Okeechobee had noted that the backpumping of a portion of EAA runoff to the lake (to increase its storage capacity) also contributed nutrients to the lake. The Special Project, as well as the Governor's Conference several years earlier, recommended this backpumping be discontinued in order to reduce nutrient loads to the lake.[17] Although there was awareness of eutrophication of the WCAs, with probable cause being nutrient laden runoff from the EAA, and statutory requirements to prevent this eutrophication, only the Florida State Planning Director in the Bureau of Comprehensive Planning expressed concern with the potential impacts to the Everglades. The Planning Director recommended that the District undertake a "systematic evaluation of all retention areas" to treat EAA runoff.[18] In 1979, following a lawsuit led by environmental groups to improve Lake Okeechobee, the Florida Department of Environmental Regulation approved the District's Interim Action Plan to stop the backpumping EAA without provisions for water treatment. The Interim Action Plan took effect in 1981 and caused a 15% increase in phosphorus loads to the WCAs.

Realization of the impact of EAA runoff on the Everglades grew immediately following institution of the Interim Action Plan. The attention, however, ignored the other 85% of Everglades phosphorus loading from the EAA, and the ideas for responses remained conflated with strategies for Lake Okeechobee. In 1982 the Florida Game and Fresh Water Fish Commission suggested a redesign of agricultural practices in the EAA to reduce demand for water management, and the use of the Holey Land to "provide some degree of water quality and quantity relief to Lake Okeechobee."[19] The District considered stormwater permitting strategies in the EAA under delegation from the Florida Department of Regulation, but three years later the agency announced that it did not intend to regulate individual agricultural interests in the EAA. Instead, District staff proposed a half-mile flow-way in the EAA to treat the area's runoff. In 1985 the Florida Legislature formed the first Lake Okeechobee Technical Advisory Council (LOTAC I), and the council recommended the use of the Holey Land to reduce the impacts of the Interim Action Plan.

The LOTAC I report also recommended diversions of nutrient laden inflows to the lake without consideration of the impacts on the new receiving waters. These recommendations, along with a large algae bloom in the lake at the time, led to substantial criticism of the District's environmental performance. The District responded to the criticism with an internal reorganization to better integrate environmental programs, substantial gathering of public input, and the formation of the Lake Okeechobee Stakeholders Advisory Committee.[20] The combined effort resulted in the District's recommendations to the Florida Legislature regarding holistic management of nonpoint sources of pollution, especially in regards to the lake.

Under concern for the impacts of nonpoint sources of pollution across the state, and using the District's recommendations for Lake Okeechobee, the Legislature passed the Surface Water Improvement and Management (SWIM) Act. The SWIM Act established a process for creating watershed-based, comprehensive SWIM plans for degraded or threatened water bodies and required the District to establish such a plan for Lake Okeechobee. Although not required by law, but under increasing public concern and scrutiny by the Florida Department of Environmental Regulation, an interagency panel recommended that the District prepare an Everglades SWIM Plan. The District initiated development of the plan in 1987, beginning with internal data gathering and analysis.[21]

The SWIM Act explicitly prohibited lake inflow diversions that would cause adverse environmental impacts in other areas, and the Act created the second Lake Okeechobee Technical Advisory Council (LOTAC II) to study the impacts of proposed diversions as well as those resulting from the Interim Action Plan. LOTAC II's Interim Report issued in early 1988 acknowledged the impact of the entirety of the EAA runoff on the Everglades, not just the flow diverted by the Interim Action Plan.[22] LOTAC II also cited a 1987 study by Everglades National Park that found less than 30 ppb of phosphorus were required to maintain the Everglades ecology, and this figure became the first basis for a numeric phosphorus standard. LOTAC II recommended agricultural best management practices (BMPs) in the EAA, possible use of the Holey Land to treat the runoff, and development of a comprehensive plan "to prevent violations of state water quality criteria." LOTAC II's recommendations led to immediate authorization of the first pilot stormwater treatment area, the Nutrient Removal Project, in an area adjacent to the Loxahatchee National Wildlife Refuge.

### 5.2.2 Federal Phosphorus Lawsuit and Reactions

In the fall of 1988, while the District was preparing the Everglades SWIM Plan, the U.S. Department of Justice (DOJ) filed a lawsuit against the state claiming that the excess phosphorus from the EAA violated state water quality standards and agreements with the Loxahatchee National Wildlife Refuge and Everglades National Park. The lawsuit reflected the opinion among lead attorney Dexter Lehtinen, environmentalists, and the federal preserves that the District did not have the political will to adequately regulate the powerful sugar industry, especially given that Governor Bob Martinez had recently made a number of agriculture-friendly appointments to the District's Governing Board.[23] Indeed, creating firm policy for reducing phosphorus required the extensive, repeated involvement of all the branches of government and multiple collaborative processes.

The District responded to the federal lawsuit by hiring a combative law office, and a number of groups gained intervenor status, including environmentalists, the Miccosukee Tribe, and eventually the sugar industry.[24] Through divisive media campaigns, environmental groups claimed that the sugar industry was the main cause of Everglades degradation, whereas the sugar industry said that it was not the primary source of excess phosphorus and blamed "90%" of the problems on disruption of the flow regime.[25]

While the lawsuit was heating up, the District submitted its first draft of the Everglades SWIM Plan in summer 1989. The draft plan, formulated with the assistance of LOTAC II and the Everglades SWIM Plan Advisory Committee (created in early 1989 and consisting of state agencies and agricultural representatives), focused on reducing the increase in Everglades phosphorus load that resulted from the Interim Action Plan using a combination of agricultural best management practices and use of the Holey Land to provide water quality treatment.[26] The plan also sought a long-term goal of 30 ppb phosphorus, with no deadline for reaching the goal, using a tentative design of 40,000 acres of Stormwater Treatment Areas (STAs) extending the length of the levees between the EAA and WCAs (with the intention to improve sheet flow).[27] During interagency review of the draft plan, the Florida Department of Environmental Regulation rejected the plan as inadequate, stating that the plan needed stronger language with regard to BMPs and that STAs should be built on private, not public, land (and the Florida Game and Fresh Water Fish Commission concurred). There was also controversy over how much financial responsibility to place on the sugar industry. Meanwhile, the DOJ led the federal agencies in negotiations to craft a unified response to the draft plan.

Side initiatives occurred within the state's legislative and administrative branches of government. At the request of the sugar industry, the Florida Legislature created the EAA Environmental Protection District that created a taxing mechanism for the sugar industry to fund its own research of the phosphorus threat.[28] The Legislature also amended the statutes regarding stormwater management, and the DEP then required the District to apply for state permits for inflows to the WCAs. The sugar industry lobbied for legislation that would exempt the District from the permit requirement, as well require the establishment of a large STA on public land, but the bill was defeated.[29]

Early in the dispute in 1989 Governor Martinez and several moderate environmentalists proposed settlement agreements that were vague and generous to the sugar industry.[30] In late 1990 the District joined with Martinez, the moderate environmentalists, and two sugar companies to endorse a settlement proposal, but the DOJ refused to accept any agreement without strict numeric phosphorus standards, deadlines, and court oversight.

In January 1991 Lawton Chiles was elected governor under a platform of resolving the federal lawsuit. Chiles appointed new members to the District's Governing Board and requested a 60-day stay on court proceedings. Chiles held an unsuccessful "summit conference" among state and District officials, environmental groups, and the sugar industry.[31] Governor Chiles then directed Lieutenant Governor Buddy MacKay to encourage settlement, and MacKay worked with the District to recruit Timer Powers to represent the District and facilitate the next round of negotiations.[32] Powers was a former District board member who had successfully facilitated other District mediations. Powers conducted technical negotiations among the parties with the assistance of the Florida Conflict Resolution Consortium.

While the technical negotiations were occurring, the District's Governing Board, with the support of Governor Chiles and environmentalists, lobbied the Florida Legislature to enact the Marjory Stoneman Douglas Everglades Projection Act of 1991. Environmentalists believed that the law would strengthen political support for the Everglades SWIM Plan. The District and Chiles argued to the federal court that the changes in state law and administration made the lawsuit moot and unnecessary. The DOJ, however, evaluated the Everglades Protection Act as not significantly contributing to legal requirements for Everglades restoration, relying on a tenuous funding scheme, and strengthening the sugar industry's ability to challenge the future Everglades SWIM Plan in state administrative court.[33] The legal proceedings continued, and Chiles requested a year-long stay to allow the negotiations to carry on and to free up the agencies to implement the Act. The judge overseeing the case was planning to deny Chiles' request for a stay, but Chiles dramatically appeared in court and admitted that discharges to the Everglades were polluted, a fact that the state and District had previously denied. The judge granted a 60-day stay for continued technical and policy negotiations facilitated by Powers and the Florida Conflict Resolution Consortium.

At the conclusion of the court stay, the DOJ, District, and DER signed the Settlement Agreement that ended the federal lawsuit.[34] The Settlement Agreement required the institution of BMPs in the EAA, with an achievable goal of 25% load reduction (compared to a baseline period), and construction of 35,000 acres of STAs.[35] The Settlement Agreement did not specify a funding source or whether the STAs could be built on public land. The Settlement Agreement established numeric interim and long-term phosphorus standards with deadlines for Loxahatchee National Wildlife Refuge and Everglades National Park.[36] Since scientific uncertainty remained concerning the level of phosphorus that would not degrade the Everglades (with the Settlement Agreement specifying a long-term standard of about 10 ppb phosphorus), the agreement directed the agencies to conduct research and make a determination. If the planned BMPs program and STAs were unable to achieve the phosphorus standards, the Settlement Agreement required actions to meet the standards, i.e., a combination of STAs expansion, intensified management of the STAs, and improvements to the BMPs program. These actions were likely since the STAs were expected to achieve outflow concentrations around 50 ppb phosphorus. The court maintained jurisdiction over the Settlement Agreement through a federal Consent Decree. To enable the ongoing technical work needed for implementation, the Settlement Agreement established the Technical Oversight Committee (TOC) composed of representatives from the District, Florida Department of

Regulation, Loxahatchee National Wildlife Refuge, Everglades National Park, and the Corps.

Following the Settlement Agreement, the District finalized the Everglades SWIM Plan (which incorporated terms of the Settlement Agreement and Everglades Protection Act), developed the BMP Program, established the EAA's permit with the District, and applied for an interim stormwater permit from the DER.[37] The District convened the collaborative Stormwater Treatment Area (STA) Design Working Group during this time. In association with the Everglades SWIM Plan, the District created the interagency and multi-stakeholder Scientific Advisory Group for the Everglades (SAGE) to assist the District's Governing Board with technical matters.

The sugar industry immediately filed numerous lawsuits against the Settlement Agreement and the Everglades SWIM Plan, thus blocking implementation of the plan. The sugar industry felt that the Settlement Agreement was too open-ended with respect to how much the industry would be required to pay for restoration in money and land for ever-expanding STAs.[38] One of the main arguments the sugar industry made in court, however, was that the Everglades SWIM Plan did not place sufficient emphasis on flow regime restoration, although it already included project features to address sheet flow and flow volume. The federal government and several environmental groups obtained intervenor status. Environmental groups were also politically fighting the sugar industry, calling for a complete public buy-out of the EAA and proposing a penny-a-pound sugar tax ballot measure.

In late 1992 the District, DER, and DOJ initiated mediation with the sugar industry. The Florida Conflict Resolution Consortium connected the parties to Gerald

Cormick, a highly regarded environmental mediator based in Seattle, to conduct the mediation.[39] Cormick persuaded the parties to open up the negotiation to other interests, such as small sugar growers, urban communities, environmentalists, and the Miccosukee Tribe, because of the interconnectivity of issues and better potential to reach lasting agreement.[40] The sugar industry requested a stay on the litigation, and Cormick formed a Technical Mediation Group and a policy group. The technical mediation produced the Technical Plan that refined the design for STAs, relaxed the phosphorus monitoring scheme (by incorporating more pristine areas), and delayed deadlines for reaching the numeric phosphorus standards.

During the technical mediation, the newly appointed Secretary of the U.S. Department of Interior (DOI), Bruce Babbitt, took an interest in Everglades restoration at the urging of Carol Browner, administrator of the U.S. Environmental Protection Agency and former director of the Florida DER.[41] Babbitt, who was ultimately concerned about the success of the C&SF Project Restudy, secretly met with Flo-Sun and, with MacKay's blessing, assigned his assistant secretary to negotiate a settlement with the sugar industry.[42] In summer 1993 the DOI, Corps, District, Florida Department of Environmental Protection (DEP, formerly Florida Department of Regulation), and sugar industry announced the Statement of Principles, which incorporated Cormick's mediated Technical Plan.[43] The Statement of Principles limited the amount of money the sugar industry would pay for phosphorus reduction, which amounted to about a third of the total estimate cost, and specified sources for the publicly funded portion. The sugar industry agreed to withdraw its lawsuits after a 90-day period to finalize the details of the new agreement with Cormick's facilitation.

Many environmental groups and the Miccosukee Tribe immediately attacked the Statement of Principles and Technical Plan for its relaxation of standards and deadlines, failure to address larger restoration issues, and for not holding the sugar industry more financially accountable. A Florida Bay sportsman and developer, George Barley, founded the Save Our Everglades advocacy organization and launched a campaign to place the penny-a-pound sugar tax on the upcoming Florida election ballot.[44] The Miccosukee Tribe hired Lehtinen, who had resigned from the DOJ, as counsel. And the DOI convened the South Florida Ecosystem Restoration Task Force and Working Group to improve relationships and coordination across the ecosystem to support the C&SF Project Restudy.

In late 1993 the sugar industry withdrew from negotiations because of several developments that it found troubling, including the penny-a-pound sugar tax campaign, the Working Group's Federal Objectives report that suggested public acquisition of the entire EAA, the U.S. Environmental Protection Agency (EPA) requirement of a federal NPDES permit for the STAs, and other issues regarding long-term funding and schedules.[45] Soon thereafter, Chiles announced his intent to continue litigation and rulemaking in support of the Everglades SWIM Plan and to lobby for strengthening the Everglades Protection Act. One sugar company returned to the negotiations and convinced Babbitt to allow the settlement to be finalized through lawmaking in the Florida Legislature. The Legislature built upon the mediated Technical Plan and the Statement of Principles, and all parties lobbied for additional changes. In late spring 1994 the state passed the Everglades Forever Act (EFA).[46]

The Everglades Forever Act established the Everglades Program, which replaced the Everglades SWIM Plan. The Act continued the BMPs requirement and specified 40,000 acres of STAs in the EAA (called the Everglades Construction Project). The Act required the agencies to complete research regarding the state's numeric phosphorus standard (phosphorous criterion) by December 2001 and for the DEP to adopt it into administrative rule by December 2003, otherwise a 10 ppb criterion would apply. The federal court retained oversight and the Consent Decree was modified to adjust the deadlines.[47]

### 5.2.3 Implementation of the Everglades Forever Act

Implementation and amendment of the Everglades Forever Act (discussed in this section and the next) were notable in the lack of obvious use and impacts of collaboration, despite high policy making activity and the presence of several ongoing processes, including the Technical Oversight Committee and the ecosystem level groups. A few ad hoc collaborative processes occurred, but at a low level of import.

Implementation of the two main components of the Everglades Program, the BMPs and STAs, generally met expectations. By early 1995 the EAA BMP Program was in place and has reduced annual phosphorus loads from the EAA by about a third.[48] The phosphorus load reductions were level over the timeframe of the BMP Program rather than showing signs of continuous improvement.[49] The Everglades Construction Project was constructed during 1997 to 2007 and improved water quality to less than 50 ppb phosphorus, representing over 70% reduction in phosphorus loads for the water passing through them.[50] The largest STA reported an annual outflow concentration as low as 13 ppb phosphorus in 2005.

The Everglades Forever Act recognized that the STAs were not capable of reaching the approximately 10 ppb phosphorus level required to maintain the Everglades ecology, so in 1996 the District began a research program to identify supplemental technologies. The most promising technology was periphyton-based STA, and the Corps constructed large-scale pilot projects during 2003-07. The periphyton-based STA studies found that the technology could reduce phosphorus concentrations to less than 10 ppb, but the large acreage required was problematic. By 2005 there were concerns about STA aging (i.e., loss of phosphorus removal efficiency over time) and susceptibility to storm damage.

The Save Our Everglades group continued to fight the sugar industry over restoration funding. In 1996 the group placed three measures on the ballot. The penny-a-pound sugar tax measure was narrowly defeated, but the "polluter pays" and publicly funded Everglades Trust Fund measures passed. The polluter pays provision, which would require the sugar industry to entirely fund cleanup, required enabling state legislation that was not forthcoming. In 1996 the U.S. Congress considered a sugar tax but instead contributed $200 million to the restoration initiative. In 1997 the state legislature, District, and DEP dealt with a number of restoration funding issues.

The Everglades Forever Act settled the sugar industry lawsuits, but it did not end litigation. The Miccosukee Tribe, under Lehtinen's counsel, filed numerous lawsuits over the years in support of implementing the Settlement Agreement.[51] In 1995 the Tribe sued the U.S. Environmental Protection Agency for failing to review the Everglades Forever

Act under the federal Clean Water Act. The court ruled that the agency must review the Act, and the agency subsequently found the state's law to be acceptable.

The Miccosukee Tribe also sued DEP in 1995 to begin rulemaking for the phosphorus criterion, and an appeals court ruled in favor of the tribe. The deadline for DEP to propose the phosphorus criterion was December 2001. In 1999 DEP scientists reported that a concentration of 8.5 ppb phosphorus was needed to protect the Everglades. From summer to fall 2001 the DEP held facilitated collaborative workshops to "take a fresh look at the science."[52] Following the workshops the DEP recommended a phosphorus criterion of 10 ppb.

In 2002 the Miccosukee Tribe complained of delays in STA construction and violations of the interim phosphorus standard in the Loxahatchee National Wildlife Refuge. At the insistence of the tribe, federal judicial oversight became more active, although the court denied the tribe's request to appoint a special judge to review progress. The Miccosukee then sued the District and other agencies over the exceedance of the LNWR interim phosphorus standard.

### 5.2.4 Amendment of the Everglades Forever Act

The Everglades Forever Act required the District to submit by December 2003 an application for modification of Everglades Construction Project's permit to achieve the state's phosphorus criterion (known as the Long term Compliance Permit). In support of this process, the District commissioned, with significant funding from the sugar industry, Basin Specific Feasibility Studies from the same consultants that prepared the mediated Technical Plan. In early 2002 the District admitted that the fully implemented Everglades

Program would not achieve the phosphorus criterion and that additional technological measures were uncertain and cost prohibitive. The District also claimed that implementation of the Comprehensive Everglades Restoration Plan would make some water quality measures unnecessary (mainly for basins other than the EAA), although such CERP water quality components had yet to be defined. Simultaneously, the DEP proposed language for the Phosphorus Rule (to establish the phosphorus criterion) that included the possibility of basing the standard on available pollution control technology rather a strictly numeric standard. The District's Governing Board directed the consultants to prepare a Conceptual Plan for Achieving Long term Water Quality Goals in the Everglades Agricultural Area (Long term Plan) using the likely DEP phosphorus rule rather than the initially presumed 10 ppb limit. The Governing Board approved the draft Long term Plan in spring 2003 and sent it to the Florida Legislature for consideration.[53] Several months later the Legislature amended the Everglades Forever Act in accordance with the Long term Plan, and the District finalized its permit application.

The Amendment to the Everglades Forever Act directed a lenient phosphorus criterion (averaged over many monitoring stations over five-year periods, with individual stations allowed to reach an annual level of 15 ppb), delayed compliance with the phosphorus criterion to 2016 (with possible extension to 2026), deemed permittees in compliance as long as they followed the Long term Plan (which was based on available technology), and prohibited new taxes on the sugar industry. Since the federal Consent Decree still held, the Amendment proposed construction of additional STAs after 2006 if necessary (the state's Acceler8 initiative announced in fall 2004 included STA expansions). Additionally, the sugar industry filed a lawsuit to postpone institution of the 10 ppb default criterion until final adoption of the rule and conclusion of administrative challenges and appeals.

In keeping with the amendments to the Everglades Forever Act, the Florida Environmental Regulation Commission approved DEP's Phosphorus Rule in late 2003. The rule presented a complicated phosphorus criterion with no deadline and instead required implementation of pollution control technology by the end of 2006. The phosphorus criterion sought "net improvement" rather than strict limits and applied different standards for areas of the Everglades already impacted by excess phosphorus. Several additional changes to the rule occurred in 2005.

After the EFA Amendment and following from an earlier request and lawsuit by the Miccosukee Tribe, the judge who was overseeing the Consent Decree, William Hoeveler, ordered a Special Master to monitor compliance with the terms. Hoeveler was dismissed from the case after he criticized the EFA Amendment, but the newly appointed judge, Federico Moreno, followed through with the appointment of a Special Master.[54] By mid-2005 the Special Master's investigations found problems with exceedances of the phosphorus standard in LNWR occurring since 1999 and failure to construct one STA (to serve LNWR) by its deadline. Moreno required the state and Corps (which was constructing the STA) to provide a detailed plan of action or the court would mandate deadlines. Following Moreno's statements, Governor Jeb Bush met with the federal George W. Bush administration over a year's time to persuade it to release the state from court oversight. In summer 2006 the Special Master reported additional violations, but recommended that Moreno accept the existing Long term Plan, including the Acceler8 projects and other planned improvements, while maintaining court oversight. At the end of 2006 the Technical Oversight Committee (TOC) failed to reach agreement concerning whether the state's phosphorus criterion or the long-term standards from the Settlement Agreement was more ecologically protective, so the latter took effect on its December 31st deadline.

Characteristically, the Miccosukee Tribe responded to the Everglades Forever Act Amendment and the Phosphorus Rule with lawsuits. In 2003 the tribe sued the state regarding the rule, and the court sided with the state.[55] In 2004 the tribe along with Friends of the Everglades sued the U.S. Environmental Protection Agency claiming that the EFA Amendment violated the federal Clean Water Act. The court required the agency to determine whether the amendment was consistent with federal law and whether the state's phosphorus criterion would protect LNWR and ENP.[56] The EPA in turn approved the law and rule.[57] In mid-2008 the court ruled that the EFA Amendment changed water quality standards and that the EPA acted arbitrarily and capriciously in declaring otherwise.

With the initial Long term Plan in place, the District frequently revised the plan to incorporate projects to expand and improve the functioning of the STAs, such as those proposed under Governor Jeb Bush's Acceler8 initiative announced in late 2004. Acceler8 planned an additional 23,000 acres STAs in the EAA and canal improvements to allow better distribution of flow among the STAs.[58] Construction of the additional STAs began in 2006 and was expected to be complete by 2010. In 2006, under public pressure, the District commissioned a study of water quality data across the EAA in order to identify opportunities for improving the BMP Program.

In mid-2008 planning for the EAA took another leap when the newly elected Governor Charlie Crist announced the District's intention to purchase U.S. Sugar Corporation, including its 187,000 acres primarily in the northern EAA, to provide land for construction of water storage reservoirs.[59] The details of the agreement were still under discussion at the end of the case study, but there were signs that the purchase would be scaled back.

The future land use of the Everglades Agricultural Area is uncertain. Depletion of the shallow soils in the southern EAA allowed the land to convert from agriculture to STAs and planned reservoirs (under CERP). Eventually soil loss in the northern EAA will make that area more economically suitable for cattle grazing and urban development. The pressure for urban development in the EAA, however, is not strong, and most population growth in the area is expected to occur in existing communities along Lake Okeechobee.[60] Several environmental groups are advocating the creation of a coordinated land use plan for the EAA that recognizes its special relationship to Everglades restoration.[61]

Table 4 lists the major events in the phosphorus case. For each event, the table indicates the primary type of governance process involved or resulting (collaborative, political, bureaucratic, judicial, or scientific), or whether it was an environmental change.

Table 4 Chronology of Major Events in the Phosphorus Case

| Date | Event | Type |
|---|---|---|
| 1965 | EAA and WCAs created by the C&SF Project | E |
| 1971 | District observed impacts of excess phosphorus in WCAs | B |
| 1973 | District first considered water quality standards for nutrients discharged to District waters | B |
| 1973 | Special Project to Prevent the Eutrophication of Lake Okeechobee initiated | C |
| 1975 | State's narrative criterion for nutrients legislated | P |
| 1975 | District first considered requiring a sugar grower to monitor nutrients and detain runoff | B |
| 1978 | Florida's Planning Director recommended that the District consider a regional approach to creating retention areas for treating EAA runoff (the idea for STAs) | B |
| 1979 | ENP, LNWR, and state signed water quality protection agreement | B |
| 1981 | District's Interim Action Plan increased phosphorus load to WCAs | B/E |
| 1982 | Florida Game and Fresh Water Fish Commission first suggested changes in EAA agricultural practices (idea for BMPs) | B |
| 1985 | Lake Okeechobee Technical Advisory Council (LOTAC I) initiated | C |
| 1986 | Lake Okeechobee large algae bloom and criticism of District | E/P |
| 1986 | District reorganized and submitted recommendations for watershed approach to Florida Legislature | B/C |
| 1987 | Surface Water Improvement and Management (SWIM) Act passed | P |
| 1987 | Interagency panel recommended District prepare Everglades SWIM Plan, and District initiated planning | C/B |
| 1987 | LOTAC II initiated | C |
| 1988 | STA pilot project initiated | B |
| 1988 | Department of Justice sued state and District concerning phosphorus | J |
| 1989 | Advisory Committee for Everglades SWIM Plan created | C |
| 1989 | Martinez settlement agreements proposed and rejected | P |
| 1991 | Mediated technical negotiations (under Timer Powers) initiated | C |
| 1991 | Marjory Stoneman Douglas Everglades Protection Act passed | P |
| 1991 | Settlement Agreement ended federal lawsuit | J |

Table 4 (continued)

| Date | Event | Type |
|---|---|---|
| 1991 | Technical Oversight Committee created | C |
| 1991 | Stormwater Treatment Area Design Working Group convened | C |
| 1992 | Everglades SWIM Plan issued | B |
| 1992 | Scientific Advisory Group for the Everglades (SAGE) created | C |
| 1992 | Sugar industry filed lawsuits against the Everglades SWIM Plan (in addition to lawsuits against the Settlement Agreement) | J |
| 1992 | Mediated technical and policy negotiations (under Gerald Cormick) initiated | C |
| 1993 | Negotiations under DOI's Bruce Babbitt resulted in Statement of Principles | C |
| 1993 | Babbitt created South Florida Ecosystem Restoration Task Force and Working Group | C |
| 1994 | Everglades Forever Act passed | P |
| 1994 | Everglades Program replaced Everglades SWIM Plan | B |
| 1995 | EAA BMP Program established | B |
| 1995 | First of several Miccosukee lawsuits against state and federal agencies to implement the Everglades Forever Act | J |
| 1996 | District began researching technologies to reach 10 ppb phosphorus | B/S |
| 1996 | Save Our Everglades placed ballot measures to force sugar industry to pay for phosphorus reduction | P |
| 1997 | Construction of STAs initiated | E |
| 2001 | Collaborative workshop for phosphorus criterion convened | C |
| 2002 | Basin Specific Feasibility Studies determined that Everglades Program would not achieve the phosphorus criterion | B |
| 2002 | Miccosukee reported violations of Consent Decree and requested Special Master | J |
| 2003 | Periphyton STA pilot projects initiated | B |
| 2003 | District's Governing Board approved the draft Long term Plan | B |
| 2003 | Everglades Forever Act amended | P |
| 2003 | State's Phosphorus Rule issued | B |
| 2003 | Miccosukee filed first lawsuits concerning EFA amendment and Phosphorus Rule | J |

Table 4 (continued)

| Date | Event | Type |
|---|---|---|
| 2003 | Special Master appointed for Consent Decree | J |
| 2003 | Water Resources Advisory Commission convened first workshops for revisions to Long term Plan | C |
| 2004 | Acceler8 announced | B |
| 2006 | Acceler8 STA expansions initiated | E |
| 2006 | Technical Oversight Committee (TOC) failed to reach agreement concerning protective phosphorus standard | C |
| 2006 | Deadline for attaining long-term phosphorus standards in Consent Decree | J |
| 2007 | Everglades Program STAs completed | E |
| 2008 | District announced plans to purchase U.S. Sugar Corporation | B |
| 2008 | Court ruled U.S. Environmental Protection Agency review of EFA amendment was insufficient | J |

Type: C – collaborative process, P – political process, B – bureaucratic process, J – judicial process, S – scientific process, E – environmental change

**5.3 Notes**

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[1] G. H. Snyder, and J. M. Davidson, "Everglades Agriculture: Past, Present, and Future." In *Everglades: The Ecosystem and its Restoration*, edited by Steven M. Davis and John C. Ogden (Boca Raton, FL: St. Lucie Press, 1994). ; Curtis J. Richardson, *The Everglades Experiments: Lessons for Ecosystem Restoration* (New York, NY: Springer, 2008).
[2] Davis and Ogden, *Everglades*.
[3] Nelson Manfred Blake, *Land into Water—Water into Land: A History of Water Management in Florida* (Tallahassee, FL: University Presses of Florida, 1980).
[4] Richardson, *The Everglades Experiments*.
[5] South Florida Water Management District and Florida Department of Environmental Protection, "2008 South Florida Environmental Management Report. Volume 1: The South Florida Environment," https://my.sfwmd.gov/pls/portal/docs/PAGE/PG_GRP_SFWMD_SFER/PORTLET_SFER/TAB2236041/VOLUME1/vol1 (accessed July 18, 2008), 17.
[6] Richardson, *The Everglades Experiments*.
[7] South Florida Water Management District and Florida Department of Environmental Protection, "2008 South Florida Environmental Management Report." STAs 5 and 6 are excluded from the discussion because they treat flows almost exclusively from the C-139 and C-139 Annex basins (see Figure 3). These values provide only an estimate of the threat reduction because STA inflows included sources other than the EAA, including Lake Okeechobee and the C-51W basin adjacent to WCA 1. Also complicating estimation of actual threat reduction was the fact that at times flows bypassed the STAs and entered the Everglades without being treated.
[8] South Florida Water Management District, "Cattail Expansion Rate Slows: Encouraging Sign for Everglades Recovery." *Water Matters* (newsletter, October/November 2003).
[9] Snyder and Davidson, "Everglades Agriculture."
[10] Litigation testimony (various), http://www.law.miami.edu/library/everglades/ (accessed April 9, 2007).
[11] The Loxahatchee National Wildlife Refuge had monitored vegetation since 1961 and noted changes along the peripheral canals since the mid 1960s.
[12] Arthur R. Marshall, "The Kissimmee-Okeechobee Basin" (presented to the Florida Cabinet. December 1972).
[13] Litigation testimony (various).
[14] The grower was not in the EAA. Litigation testimony (various).
[15] The federal Clean Water Act did not require NPDES permits for the EAA because farmland was exempt.
[16] Bureau of Comprehensive Planning, "Final Report on the Special Project to Prevent Eutrophication of Lake Okeechobee" (Tallahassee, Florida: Division of State Planning, Florida Department of Administration, 1976).
[17] The backpumping resulted from the Corps' 1968 Survey-Review, with intention to increase water storage in the lake.
[18] Litigation testimony (various).
[19] Ibid.

[20] Patricia A. Bidol and Stephen S. Light, "Innovative Approaches to Managing Water Crises: Alternative Dispute Resolution for Lake Okeechobee" (South Florida Water Management District, no date).
[21] Litigation testimony (various).
[22] Lake Okeechobee Technical Advisory Council (LOTAC II), "Interim Report to the Florida Legislature" (February 29, 1988).
[23] Michael Grunwald, *The Swamp: The Everglades, Florida, and the Politics of Paradise* (New York, NY: Simon & GSchuster, 2006).
[24] Grunwald, *The Swamp*.
[25] Ibid.
[26] South Florida Water Management District, "Draft Surface Water Improvement and Management Plan for The Everglades, Volume I: Executive Policy Summary" (August 9, 1989).
[27] The placement of the STAs was intended to incorporate the flow regime restoration objectives demanded by the sugar industry and encouraged by the holistic approach of SWIM planning.
[28] The sugar industry proposed this initiative prior to the federal phosphorus lawsuit.
[29] Grunwald, *The Swamp*.
[30] Nat Reed, Republican environmentalist and District board member, and Charles Reed of the Audubon Society) endorsed a plan that would have limited the sugar industry's liability to $40 million. Grunwald, *The Swamp*.
[31] DeWitt John, *Civic Environmentalism: Alternatives to Regulation in States and Communities* (Washington, D.C.: Congressional Quarterly, 1994).
[32] John, *Civic Environmentalism*. ; Grunwald, *The Swamp*.
[33] John, *Civic Environmentalism*.
[34] The Florida Department of Environmental Regulation was represented by Carol Browner who later joined the Clinton Administration.
[35] "Settlement Agreement," United States vs. South Florida Water Management District et al. Case No. 88-1886-CIV-Hoeveler (United States District Court Southern District of Florida, July 26, 1991).
[36] The deadlines for meeting the interim and long-term standards were later renegotiated. The deadlines in effect were July 2002 for LNWR and December 31, 2006 for ENP.
[37] Everglades Best Management Practices Regulatory Program and Everglades SWIM Rule for the EAA, also known as EAA Regulatory Program. ; South Florida Water Management District, "Surface Water Improvement and Management Plan for The Everglades: Planning Document. Executive Summary" (March 13, 1992).
[38] John, *Civic Environmentalism*. ; Grunwald, *The Swamp*.
[39] Gerald Cormick facilitated the first environmental mediation in the United States in 1972.
[40] John, *Civic Environmentalism*.
[41] Grunwald, *The Swamp*.
[42] Ibid.
[43] "Statement of Principles" (Signed by U.S. Department of the Interior, U.S. Army Corps of Engineers, South Florida Water Management District, Florida Department of Environmental Protection, U.S. Sugar Corporation, South Bay Growers, Inc., and Flo-

Sun Inc., July 3, 1993). ; Burns & McDonnell, “Everglades Protection Project: Conceptual Design” (South Florida Water Management District, 1994).

[44] The group later became Save Our Everglades Trust and Save Our Everglades Foundation.

[45] Grunwald, *The Swamp*. ; Science Sub-Group, “Federal Objectives for the South Florida Restoration by the Science Sub-Group of the South Florida Management and Coordination Working Group” (1993), http://www.sfrestore.org/sct/docs/subgrouprpt/index.htm (accessed January 30, 2006).

[46] In protest over the Act’s provisions, Marjory Stoneman Douglas asked that her name be removed from the law. Grunwald, *The Swamp*.

[47] The new deadlines for interim numeric phosphorus standards for the LNWR and ENP were February 1, 1999, and December 31, 2003, respectively; the long-term standards deadline for both areas was December 31, 2006.

[48] The average annual load for full-BMP implementation since WY2006 was 130 metric tons, compared to 182 metric tons for the rainfall adjusted predicted load for the baseline period of 1978 to 1988. South Florida Water Management District and Florida Department of Environmental Protection, “2008 South Florida Environmental Management Report. Volume 1: The South Florida Environment,” https://my.sfwmd.gov/pls/portal/docs/PAGE/PG_GRP_SFWMD_SFER/PORTLET_SFER/TAB2236041/VOLUME1/vol1 (accessed July 18, 2008), 17.

[49] The EAA has achieved its target reduction of 25% from the baseline period for every year with the exception of WY2007 when the basin achieved only an 18% reduction. Executive Summary, 2008 South Florida Environmental Report. South Florida Water Management District. March 2008. p. 2

[50] Everglades Nutrient Removal Project originally recommended by LOTAC II became operational in 1994. By late 1997 the first STA (STA 6 Section 1) was completed, followed by STAs 1W, 2, and 5 in 1999. The goal was to complete all the STAs by 2003, however, construction fell behind schedule and concluded in early 2007. In February 2004 STA 3/4 was completed. In February 2006 STA 1E was completed. In July 2007 STA Section 2 was completed. STA 5 had difficulty achieving less than 50 ppb because of additional flows from C-139 basin. For 70% figure, see South Florida Water Management District and Florida Department of Environmental Protection, “2008 South Florida Environmental Management Report,” 2.

[51] Keith W. Rizzardi, “Alligators and Litigators: A Recent History of Everglades Regulation and Litigation.” *The Florida Bar Journal* LXXV no 3 (2001): 18.

[52] Grunwald, *The Swamp*.

[53] Burns & McDonnell, “Everglades Protection Area Tributary Basins Conceptual Plan for Achieving Long-Term Water Quality Goals. Executive Summary” (South Florida Water Management District, 2003).

[54] A Miami lawyer who had experience mediating environmental disputes, in late 2003.

[55] In July 2004 the state adopted the phosphorus criterion rule after the court ruled in favor of the state. The Miccosukee appealed. In July 2005 the appeals court upheld the standards rule, and EPA approved it.

[56] In May 2004. The judge required EPA to issue a report on the matter.

[57] Additionally the EPA became involved with phosphorus standards through the development of Total Maximum Daily Loads (TMDLs), with several Everglades TMDLs completed in 2006-07 and others due by 2011.

[58] The state's Acceler8 initiative added 5,300 acres to existing STAs (2, 5, and 6) and 18,000 acres of buildouts (Compartments B and C) and canal improvements to aid in redistributing flow between STAs (the Cross-Boles project or Boles & Cross Canal?). EAA STA Expansion project (same as Accerl8 projects?).

[59] Governor's Press Office, "Governor Crist Unveils Momentous Strategy to Save America's Everglades, Preserve National Treasure" (June 24, 2008), http://www.flgov.com/release/10065 (accessed on August 20, 2009).

[60] Snyder and Davidson, "Everglades Agriculture."

[61] Including the Arthur Marshall Foundation and the Audubon Society. For example: Audubon of Florida, Florida Wildlife Federation, and 1000 Friends of Florida "Vision for a Sustainable Everglades Agricultural Area," www.audubonofflorida.org/.../pubs_policydocs-EAA_Sustainability0405.pdf (accessed August 20, 2009).

# CHAPTER 6

# SHARK SLOUGH CASE

This chapter presents an overview of Shark Slough restoration progress and details of the governance events that produced the progress. The overview of progress describes the historic Shark Slough and its ecological significance, development impacts to the slough, and a summary of the major restoration projects and policies. The chronology of events is divided into four subsections according to significant progressions towards improved ecosystem management, as Shark Slough governance gained a more holistic perspective. For each subsection, a brief discussion of the role of collaborative processes is included. A table outlining the major events is provided at the end of the chapter.

## 6.1 Overview of Shark Slough Restoration Progress

### 6.1.1 Historic Shark Slough

Shark Slough, also known as Shark River Slough, is a limestone depression in the southern Everglades that historically funneled over a million acre-feet of flow per year (see Figure 2).[1] The Shark Slough's ridge and slough landscape provided an important dry season and drought refuge for aquatic life when the adjacent wet prairies dried out.[2] Shark Slough's flows supported the mangrove forests and estuaries of Whitewater Bay and the Ten Thousand Islands. On the eastern edge of the Everglades, seasonal floods recharged the Biscayne Aquifer that flowed to Biscayne Bay. At times of high flooding, some flows passed across gaps in the coastal ridge to the much smaller Taylor Slough that fed Florida Bay (shown in Figure 2).

### 6.1.2 Shark Slough Flow Regime Threat

Figure 4 shows many of the features of the central and southern Everglades that are discussed in this subsection and Section 6.2. Disruption of flow in Shark Slough began in the early 1900s. The Everglades drainage canal closest to Shark Slough, the Miami Canal, was connected to the coast in 1912 and moderately reduced southward sheet flow. The first direct modification of Shark Slough occurred during the 1920s with the construction of the Tamiami Trail highway and the adjacent canal across the northern part of the slough (which is 11 miles wide at this location). Flow under the highway was permitted via numerous culverts, and at times flow overtopped the roadbed. Degradation of the Everglades landscape to the south of Tamiami Trail was observable by about a decade after the highway's construction.[3]

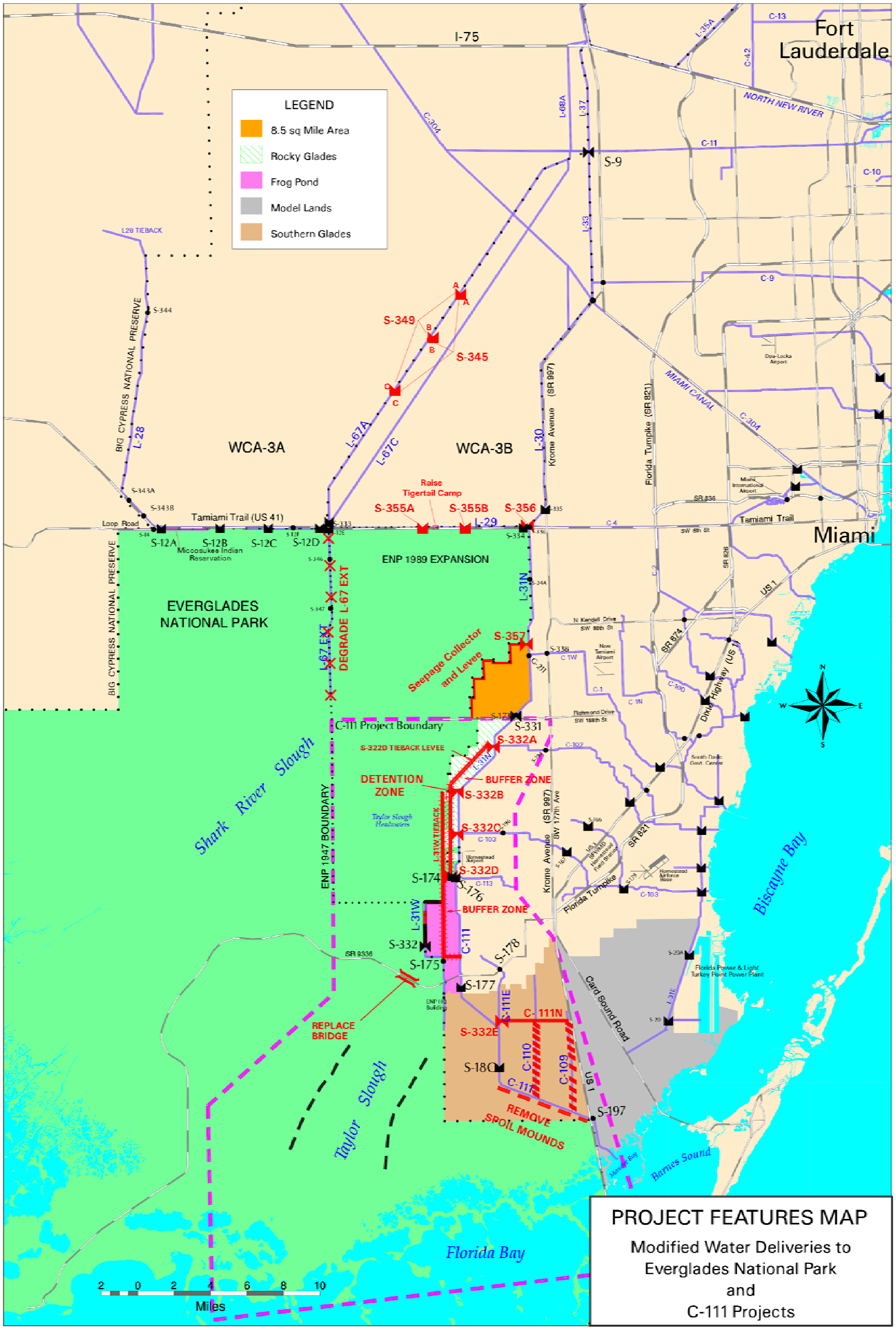


Figure 4 Southern Everglades with Restoration Projects. Source: U.S. Institute for Environmental Conflict Resolution, 2002[4]

The largest assault on the Shark Slough flow regime occurred with the construction of the Central and Southern Florida (C&SF) Project during the 1950s and early 1960s.[5] The C&SF Project created Water Conservation Areas 3A and 3B that eliminated natural overland flow at Shark Slough's headwaters north of Tamiami Trail. The C&SF Project released (or "delivered") flow to Everglades National Park from WCA 3A via gates located west of Shark Slough (the S-12 gates). Upon construction of WCA 3A, the South Florida Water Management District released water through the S-12 gates depending on the need to maintain water level in the WCAs for water supply and flood control purposes, and not on the needs of ENP. A north-south levee extension (L-67 Ext) built across the slough along the original eastern boundary of ENP discouraged these water releases from spreading to the east. The C&SF Project prohibited flow to Northeast Shark Slough (i.e., WCA 3B and a portion of the East Everglades), the area that had historically received the majority of flow, in order to keep water from seeping into the aquifer and because of interest in developing the area. Additionally, the C&SF Project's large north-south levee and canal severed a portion of the slough's headwaters, opening up the land for westward expansion of Miami. The area between the original ENP eastern border and the north-south levee L-31N (see Figure 4) is called the East Everglades.

In the mid 1960s, the canal system was extended for agricultural development in southeast Dade County, connecting the C&SF Project to the existing C-111 System that served the coastal area to the southeast of Taylor Slough. The connected system drained the East Everglades, including the headwaters to Taylor Slough, further promoting agricultural and residential development. Figure 4 shows development areas in the East

Everglades, including the 8½ Square Mile Area (8.5 SMA) residential and agricultural area, the Frog Pond agricultural area, and the Rocky Glades (or L-31N Transition Lands) agricultural area. These areas are very vulnerable to flooding, since they are west of the major north-south levee and have a highly porous surficial aquifer. The 8.5 SMA was particularly controversial because development occurred against local land use policies designed to protect aquifer recharge and discourage development in areas lacking flood protection.

The various modifications have caused Northeast Shark Slough to convert from a ridge and slough landscape to homogenous sawgrass plains.[6] Soil subsidence has occurred in the drier areas, especially WCA 3B. The southeastern section of WCA 3A, on the other hand, has experienced excessive water levels. The area south of the S-12 gates received more flow than it did historically and has converted from wet prairie to sawgrass. The most eastern portion of the historic southern Everglades has been lost to development. In addition to habitat alteration, the managed water flow regime has had numerous direct deleterious impacts on wildlife, including via complete dry down during droughts and sudden, excessive water levels during the nesting season.

6.1.3 Shark Slough Restoration Progress

Shark Slough restoration has many aspects to consider. A restored flow regime across the central and southern Everglades is defined by its ability to reproduce the ridge and slough landscape, maintain soils, meet the needs of native wildlife, serve other parts of the ecosystem (especially wet prairies, Taylor Slough, and coastal areas), and protect endangered species and other natural values (such as historic tree islands).[7] Exactly how such a restored flow regime should look has yet to be determined. Restoration progress is indicated by adjustments believed to move the flow regime closer to achieving the ecological objectives and within the constraints imposed by irreversible alterations such as urban development and soil subsidence. Much of the attention of Everglades flow regime restoration has focused on the Shark Slough area because of its importance to Everglades National Park.

The planned and implemented Shark Slough restoration policies and projects have addressed flow volume, timing, distribution, and profile (sheet flow). The first major initiative in 1970 improved flow through the S-12 gates, with a guaranteed minimum annual volume and more natural seasonal variation based on a static schedule (rather than actual weather patterns). The next major initiative, the Experimental Water Deliveries Program (Experimental Program), began in 1983 and distributed the WCA 3A releases by directing some flow to Northeast Shark Slough through operational changes. The Experimental Program reduced flow through the S-12s and included a rainfall-based delivery schedule for these releases. The Experimental Program tripled the annual flow to Northeast Shark Slough over the previous flow regime.[8] The improved flow, however, was still only a quarter of the historic flow, and measures to reduce flood risk to developed areas resulted in some wetlands of the East Everglades being drier than before the program.[9] Moreover, the Experimental Program's flood mitigation measures were partially to blame for the exceptionally high flood releases in 1993-95 that devastated the endangered Cape Sable seaside sparrow and led to the Interim Structural and Operational Plan/Interim Operational Plan (ISOP/IOP).[10] The ISOP/IOP resulted in less flow through the S-12 gates (and a portion of the extension levee was removed to allow spreading of flow) without increasing flow to Northeast Shark Slough, thus leading to a drier lower Shark Slough.[11] The ISOP/IOP also led to a drier WCA 3B.[12] This is the flow regime currently in effect.

The Modified Water Deliveries (MWD) Project and related C-111 Project were authorized in 1989, and implementation is expected after 2013.[13] These so-called foundational projects required substantial foundational work of their own, namely expanding Everglades National Park into the undeveloped East Everglades, acquiring and securing flood protection for private properties in the 8.5 SMA, modifications to Tamiami Trail, and coordination with downstream restoration projects in the C-111 basin (see Figure 4), including development of the Combined Structural and Operational Plan (CSOP). The MWD Project will restore some flow to WCA 3B, slightly improve sheet flow across Tamiami Trail (with a one-mile bridge), and increase annual flow volume to Northeast Shark Slough to close to forty percent of the historic level.[14] The Comprehensive Everglades Restoration Plan (CERP) authorized in 2000 included the WCA 3 Decompartmentalization and Sheet Flow Enhancement (Decomp) Project that intends to substantially restore sheet flow across WCA 3A, WCA 3B, and Everglades National Park. Other CERP projects will marginally increase annual flow volume to Shark Slough and improve natural flow timing and variation.[15] Implementation of these CERP projects is not expected before 2020 and will likely take longer given the history of delays and increasing competition for resources.

## 6.2 Shark Slough Governance

The first step in protecting and restoring Shark Slough was creation of Everglades National Park in 1947, and the park has since been a strong advocate for restoration of flow volume and timing within its borders. As described above, the policies and projects advocated by ENP evolved from a minimum water delivery schedule to a set of interrelated projects to restore flow to Northeast Shark Slough. Governance leaders used a variety of ad hoc collaborative processes in response to ENP's advocacy spanning four decades. Additionally, the collaborative ecosystem-level planning during the C&SF Project Restudy in the 1990s recognized the need for modifications beyond the foundational projects in order to meet ecological objectives. The governance events are presented below according to four major initiatives: early restoration of Shark Slough flow volume and timing (including the Minimum Delivery Schedule for ENP); early restoration of Northeast Shark Slough flow (including the Experimental Program); implementation of the Modified Water Deliveries Project; and the Comprehensive Everglades Restoration Plan. The presentation is roughly chronological, but some initiatives' activities occurred in parallel. Appendix B provides more details about the collaborative processes for this case.

### 6.2.1 Early Restoration of Shark Slough Flow Volume and Timing

The first initiative towards improving flow regime for Everglades National Park, and hence the portion of Shark Slough within the park, established ENP as an interest deserving attention. As ENP gained power, this increased communication and collaboration between Everglades National Park (and at times its parent agencies, the

National Park Service (NPS) and the U.S. Department of the Interior (DOI)), the District, and the U.S. Army Corps of Engineers. The evolution of ENP's status and interagency relationships eventually led to formal partnerships to design and implement restoration projects.

The account of Shark Slough restoration begins with the establishment of Everglades National Park. The purpose of the park was to preserve the ecological values of the southern Everglades and neighboring ecosystems, including Florida Bay and Ten Thousand Islands. One of the park's early promoters, Ernest Coe, advocated that the park's boundaries extend fifteen miles north of Tamiami Trail to protect overland flow, eastward to Biscayne Bay (thus including Northeast Shark Slough), and westward into Big Cypress Swamp.[16] Coe's failure to compromise on the boundaries eventually led to a park about half the size that excluded Northeast Shark Slough (to enable development of private property in the East Everglades). As the designation of the park neared and plans for the C&SF Project took shape in 1947, there were concerns about the long-term survival of the park since it was dependent upon upstream flow.[17]

A year later in 1948 the U.S. Congress approved the C&SF Project. The legislation authorizing the project directed the Corps to protect Everglades National Park, however there were no guarantees of water deliveries. The U.S. Department of the Interior suggested that ENP and the Corps negotiate the operational plans prior to construction, however the negotiation did not happen. In the early 1950s the District conducted studies of pre-C&SF Project overland flow to Shark Slough, and Corps engineers noted that the ENP would not receive sufficient flow under the project's design.

The construction of WCA 3 in the early 1960s halted all overland flow to Everglades National Park, and the National Park Service requested a water delivery schedule from the Corps and District. The Corps stated that it did not have authority for water allocation and deferred to the District. The Secretary of the Army suggested that an interagency coordinating committee be formed to determine a delivery schedule each year, and the NPS agreed to participate, but this was not done. ENP determined a minimum amount of annual flow needed by the park, and the National Park Service asked Congress to guarantee that amount (with a monthly schedule accounting for seasonal variation).[18] The District proposed a delivery schedule based on water levels in WCA 3A, which the park accepted rather than have no delivery schedule. The NPS then pressed the Corps to conduct a C&SF Project Survey-Review planning process (similar to a “restudy”) in order to identify structural and operational means of improving water flow to the park.

In 1965 the Corps agreed to conduct a Survey-Review and, in a pattern that repeated throughout the Shark Slough case, the agency broadened the planning scope to include consideration of all water needs of the region. During this time environmental management of the Everglades received national media and environmentalist attention as a result of wildlife (especially deer) deaths due to high water in the central Everglades, followed by a drought that negatively impacted the park.[19] The Corps’ response was to construct the L-67C canal (parallel to the existing L-67A levee and canal along the border between WCA 3A and WCA 3B) to capture seepage and send it to the park, and the L-67 Extension canal to deliver flow to the center of Shark Slough, but also with a levee to prevent water from spreading into the East Everglades during flood releases. Later restoration efforts would seek to remove these components.

In 1968 the Survey-Review process itself resulted in a new delivery schedule for ENP based on water level in Lake Okeechobee, recommendations for additional water management infrastructure (that the park rejected), and backpumping to the lake to increase its storage for water supply for future development.[20] As a result of additional advocacy by Everglades National Park since 1963, the Everglades National Park-South Dade Conveyance System was authorized to provide increased flow to Taylor Slough (via new pumping stations and canal enlargement), as well as increase water supply and flood control to South Dade County agriculture.[21] The system was constructed during 1978-82 and would later undergo modification as part of the C-111 Project.

Everglades National Park still did not have an acceptable water delivery schedule, therefore the agency elevated the issue to the federal judicial system. The U.S. Attorney General left office before resolving the issue, and the U.S. Senate asked that the agencies negotiate an agreement. The result was another schedule based on Lake Okeechobee levels. The Senate then conducted a hearing and recommended legislation guaranteeing the minimum water delivery schedule proposed by Everglades National Park. The Minimum Delivery Schedule became law in 1970 (even though the state argued that it had sovereignty over water allocation).[22]

The law that instituted the minimum delivery schedule also required the Corps to review (or "restudy") the C&SF Project in 1980 to determine if additional modifications were needed to ensure an adequate water supply to the park.[23] The Corps initiated the "restudy" in 1980 and instead focused on how the project could increase water supply for agriculture and development. The study ended in 1987 without making any recommendations. A useful output of the "restudy," however, was the District's creation of the South Florida Water Management Model. ENP used the model to simulate flow restoration through the removal of canals and levees, thus planting the technical seed for the major C&SF Project Restudy in the 1990s (discussed in Subsection 6.2.4).[24]

### 6.2.2 Early Restoration of Northeast Shark Slough Flow

The late 1960s and early 1970s had low rainfall. Civic and homeowner groups became concerned about aquifer recharge, and attention turned to the development occurring in the East Everglades. This marked the beginning of conflict over water management and land use in the East Everglades. The conflict intensified when ENP began advocating restoration of Northeast Shark Slough. Over the four decades since, stakeholder tensions and complexity of planning led to numerous collaborative processes concerning the East Everglades.

The drought accelerated residential and agricultural development in the normally flood-prone East Everglades, especially the 8.5 SMA. In 1973 civic and homeowner groups petitioned Dade County to place a moratorium on East Everglades growth, citing issues of aquifer recharge and lack of flood protection. The County complied and conducted the East Everglades Moratorium Study that recommended stringent land use regulations in the area. In 1975 the County adopted a comprehensive plan that recognized the environmental values of the East Everglades and discouraged development. Despite land use policy, development continued.

In 1978 Dade County initiated the East Everglades Resources Planning Project to address the multiple concerns in the area. The U.S. Environmental Protection Agency funded the Project as part of a program to study sensitive areas adjacent to national parks. An interagency steering committee, a citizens advisory committee, and a residents and property owners advisory committee assisted the effort. The final report focused on the importance of the East Everglades for aquifer recharge, and it briefly mentioned that ENP was exploring ways to return flow to Northeast Shark Slough.[25] Everglades National Park began considering restoration of flow to Northeast Shark Slough in 1978 when the Corps added control structures to the canal adjacent to Tamiami Trail. The purpose of the control structures was to enhance water supply to South Dade County, but ENP saw their potential to disperse flow across the slough. The Project's report recommended against residential development because of the environmental values of the area and the technical infeasibility of providing flood control given the porous surficial aquifer. In 1981 Dade County adopted the report's recommendations and designated the East Everglades as an "Area of Critical Environmental Concern" in the comprehensive plan.

In 1982 WCA 3B, the headwaters to Northeast Shark Slough, averted the threat of an airport, as Big Cypress Swamp did in the late 1960s. Some environmentalists had opposed an airport in WCA 3B, but most were in favor of the site, because they believed it was preferable to other likely locations that would have a greater impact on Everglades National Park. The newly elected Governor Bob Graham formed a committee to study the issue, and the committee recommended that no airport was needed until 2000. Indeed, an airport between ENP and Biscayne Bay, at Homestead Air Force Base, was considered in the late 1990s and rejected after another fierce political battle.[26]

Restoration of Northeast Shark Slough began in earnest in 1983 when Everglades National Park declared a crisis situation resulting from a series of ill-timed high flow releases to the park and urgently requested that the District's Governing Board approve ENP's ambitious Seven Point Proposal.[27] The park's proposal laid out most of the structural and operational changes to the C&SF Project, especially restoration of flow to WCA 3B and Northeast Shark Slough, that restoration projects would be addressing for decades to come.

The District was supportive of ENP's proposal and adopted it as the Seven Point Plan, but the Corps resisted making any changes that would increase flood risk to adjacent development (due to the porous surficial aquifer). East Everglades farmers were particularly concerned with the potential flood impacts of placing gaps in the L-67 Extension and therefore filed a lawsuit against the District and Corps for failing to complete an Environmental Impact Statement for the action (to which the Corps concurred). Mediation resulted in a negotiated settlement that allowed Northeast Shark Slough restoration to proceed provided agriculture would receive annual canal drawdowns to lower groundwater levels for agriculture (even though they would drain water from Taylor Slough in ENP).[28]

To revise ENP's water delivery schedule to incorporate more natural timing through the S-12 gates and distribution to Northeast Shark Slough, Congress authorized a two-year field test of operational changes that would become known as the Experimental Program of Water Deliveries (with General Plan for a longer timeframe of the program approved in 1985). Congress directed the Corps, District, and ENP to negotiate the terms of the experiments, and the Corps demanded that the program include operational protocols to compensate for any increases in flood risk to developed areas. Congress also authorized the Corps to acquire potentially flooded agricultural properties and to construct a flood protection system for the 8.5 SMA (even though the East Everglades Resources Planning Project had deemed such a system to be technically infeasible).[29] The Corps began preparation of the plan for the Modified Water Deliveries Project for these and other structural and operational changes needed to implement the Seven Point Plan.

During the start of the Experimental Program, the District was concerned about a campaign by East Everglades property owners to change zoning laws to allow improved flood protection and property subdivision, thus Governor Bob Graham declared the East Everglades an Area of Critical State Concern.[30] The declaration resulted in the formation of the collaborative East Everglades/ENP Resources Planning and Management Committee (EE/ENP RPMC).[31] In 1985 the Corps incorporated the EE/ENP RPMC's recommendations into the Experimental Program's General Plan, and the state pledged to acquire undeveloped properties in the East Everglades, however this initiative stalled because of landowner resistance and the initiative's low priority under the state's land acquisition program.

Concerns of environmental impacts to other areas of the basin also constrained the Experimental Program. In the early 1980s Florida Bay ecological deterioration intensified, thus placing more attention on restoring flows to Taylor Slough via the C-111 system. And by 1987 there were negative impacts on the estuaries at the outlet of the C-111 system, including as a result of more water being released to mitigate flood risk of the Experimental Program. In response, the District asked the Corps to develop the C-111 Project to address the environmental concerns and agricultural demands for enhanced flood control for year-round crops. In 1988 an interagency committee approved the C-111 Interim Plan to be instituted until more thorough planning for the C-111 Project could occur. At this time the U.S. Fish and Wildlife Service raised concerns about the potential of the C-111 Project to adversely impact the endangered Cape Sable seaside sparrow in the Taylor Slough area. Also, by the mid-1980s the Experimental Program had overly drained habitat for the endangered Everglades snail kite in WCA 3A, and the issue underwent mediation in 1990.

In 1988 Governor Bob Martinez followed outgoing Governor Graham's advice to support Everglades restoration. Martinez established the East Everglades Land Acquisition Task Force to specify land for acquisition to aid Northeast Shark Slough restoration and to determine whether expansion of Everglades National Park would be a desirable approach. The task force's recommendations, supported by then-senator Graham, along with the agencies' planning activities since the beginning of the Experimental Program, led to the Everglades National Park Protection and Expansion Act of 1989.[32] The Act expanded the park into the undeveloped areas of the East Everglades and authorized the Modified Water Deliveries (MWD) Project. The MWD Project was intended to hydrologically connect Shark Slough's historic path of flow along WCA 3A, WCA 3B, Northeast Shark Slough, and southern Shark Slough (see Figure 2), and to reduce seepage losses and provide flood protection for developed areas in the East Everglades. The Act also authorized the C-111 Project for the purposes of improving flow to Taylor Slough and reducing damaging flows to the southern estuaries. The Corps issued the plans for the MWD and C-111 projects in 1992 and 1994, respectively. The plans directed that a Water Control Plan for both projects be developed prior to completion of the projects.[33] This plan was included in the Combined Structural and Operational Plan (CSOP) developed during the mid-2000s.

### 6.2.3 Implementation of the Modified Water Deliveries Project

During implementation of the Modified Water Deliveries Project, the full extent of the challenges of restoration planning in the East Everglades, C-111 basin, and WCA 3A and 3B became known. Governance leaders frequently used ad hoc collaborative processes to resolve disputes resulting from ENP's advocacy for ecologically viable restoration plans to aid the park.

The Everglades National Park Protection and Expansion Act directed an unusual implementation arrangement for the MWD Project, with funding provided by the U.S. Department of the Interior and design and construction by the Corps. This arrangement ultimately led to gridlock when Everglades National Park became concerned over the inadequacy or risk associated with each major component of the project's design.[34] ENP's concerns stemmed from park scientists' modeling and accumulated experience with past multi-purpose and compromise projects, such as operation of the South Dade Conveyance System and the Experimental Program drying out undeveloped wetlands. The wetlands adjacent to developed areas were becoming recognized as important short hydroperiod habitat for wildlife, including for the endangered Cape Sable seaside sparrow. Also, extreme weather events, including Hurricane Andrew in 1992, indicated the flow variability the project should handle and the infeasibility of leaving private residential properties subject to regular flooding, as would occur under the MWD Project's flood mitigation system for the 8.5 SMA.[35] Moreover, modeling of the historic

Everglades as part of the C&SF Project Restudy (occurring since 1992) showed that pre-development flows through Shark Slough had been much greater than originally thought. ENP had its eye on restoring flows to this level rather than the moderate level anticipated under the MWD Project.[36] Implementation of each of the major components of the MWD Project is discussed below.

*6.2.3.1 8.5 SMA Flood Mitigation and Protection of the Cape Sable Seaside Sparrow*

The first aspect of the Modified Water Deliveries Project over which ENP expressed reservations was the flood mitigation system planned for the 8.5 SMA.[37] In 1994, during legislative consideration of an amendment to the ENP Protection and Expansion Act (for measures concerning the C-111 Project), ENP advocated (with state support) for the option of using the flood mitigation project funds for acquisition of the 8.5 SMA.[38] The Amendment included the provision but did not authorize eminent domain. Controversy of the provision led Governor Lawton Chiles to create the collaborative East Everglades 8.5 SMA Study Committee, which recommended partial acquisition and flood mitigation of the remaining development. When the Corps refused to accept the partial acquisition approach, the District studied alternatives for a possible Locally Preferred Option (where the District would provide the funding), and in 1998 the District declared that it supported full acquisition.

The reactions to the District's plans to buy out the 8.5 SMA were intense. Residents formed the United Property Owners of 8.5 SMA, and a national Hispanic rights organization took up their cause. The Miccosukee Tribe was concerned that an attempt to buy out the entire 8.5 SMA would significantly delay implementation of the MWD

Project and would therefore not relieve high water levels in WCA 3A that the tribe believed resulted from recent operational changes to protect the Cape Sable seaside sparrow.[39]

Poorly timed flood releases in the mid-1990s had decimated a sub-population of the Cape Sable seaside sparrow south of the S-12 gates, and in 1997 the U.S. Fish and Wildlife Service had sent a letter to the Corps urging modifications to the water management protocols.[40] The Corps had resisted operational changes to protect the sparrow[41], but through mediation, the agencies reached agreement on annual "emergency deviations," followed by the Interim Structural and Operational Plan (ISOP) in 2000 and the Interim Operational Plan (IOP) in 2002 (also using interagency mediations).[42] The "interim" status of these plans denoted their use until completion of the MWD and C-111 projects and development of the Combined Structural and Operational Plan. Scientists were in agreement that the eventual restoration of flow to Northeast Shark Slough through the MWD and C-111 projects would achieve protective measures for the sparrow and relieve negative ecological impacts to other areas.

The Miccosukee Tribe filed several lawsuits in response to changes to the 8.5 SMA flood mitigation system and against the emergency deviations.[43] In 1999 the Miccosukee and several homeowners sued the District for failure to comply with the state's "sunshine" law for transparent government.[44] The Miccosukee also sued the interagency Southern Everglades Restoration Alliance (SERA) created to coordinate the Experimental Program, MWD Project, and C-111 Project. The Miccosukee claimed SERA violated the Federal Advisory Committee Act and had influenced decisions to acquire the 8.5 SMA and the emergency actions for the sparrow. In response, the District backed off its commitment. When Governor Jeb Bush took in office 1999, he appointed new members of the District Governing Board, and the board overturned the decision to buy out the 8.5 SMA.[45]

To assist the District with identification of its Locally Preferred Option for the 8.5 SMA, the Corps prepared (with extensive public input) a report that presented the various proposed alternatives. In 2000, after additional agency interactions and public comment, the Corps selected the final alternative, which included acquisition of the western third of the 8.5 SMA and flood mitigation for the remaining development. In 2001 the Corps and 8.5 SMA landowners could not agree on flowage easement purchase prices. Landowners initiated negotiations with DOI, but the Corps was not aware and condemned the properties. The landowners responded with a lawsuit claiming that the Corps did not have authority to implement the alternative. The court ruled that the federal government could not purchase private land in the 8.5 SMA without state participation, and the Corps appealed. In 2002 Congress clarified that it intended for the Corps to implement the alternative and directed its expeditious completion. The 8.5 SMA partial acquisition and flood mitigation system was completed in late 2008, and the Corps was developing an interim operational plan for this system until completion of the MWD Project and institution of the Water Control Plan.

*6.2.3.2 Tamiami Trail Modifications*

The second set of concerns that Everglades National Park had regarding the Modified Water Deliveries Project was the ability of the Tamiami Trail modifications to pass the amount of water and degree of sheetflow desired for restoration of Northeast

Shark Slough. Like the flood mitigation system for the 8.5 SMA, the Tamiami Trail modifications underwent frequent revision and encountered delays.

The 1992 plan for the MWD Project recommended two water control structures in the levee adjacent to Tamiami Trail and elevation of a 1,500-feet section of the highway (i.e., a bridge). In 1996 ENP suggested to the District that, under the existing design, higher water in the canal adjacent to the highway could damage the roadbed and that flooding of the road was possible during storms, and the District began studying the concerns. In 1999 an ENP study (conducted in coordination with the District and Corps) found that the planned Tamiami Trail modifications were not large enough to pass anticipated restoration flows, and would thus cause high water levels in WCA 3B and increased water loss due to evapotranspiration and seepage (and therefore drier conditions in ENP).[46] In 2001, following scientific research stressing the importance of sheetflow to the Everglades, the South Florida Ecosystem Restoration Task Force's Science Coordination Team wrote a letter to the Corps in support of elevating Tamiami Trail.[47]

In late 2003 the Corps issued the plan for the Tamiami Trail modifications of the MWD Project. The report selected a 3,000-ft bridge, which was the longest span affordable under the U.S. Department of Interior's budget. New modeling then predicted higher water levels in WCA 3B that could damage tree islands, and the DOI asked the Corps to consider a higher water level in the canal adjacent to the highway, as well as a 4-mile bridge to coordinate with the Decomp Project under the Comprehensive Everglades Restoration Plan (see Subsection 6.2.4). Even more significant, the Florida Department of Transportation would not approve the Corps' plan without upgrading the unbridged portion of eastern Tamiami Trail in order to avoid damage to the roadbed. The Corps withdrew the Tamiami Trail plan.

In late 2005 the Corps issued a revised plan for the Tamiami Trail modifications that included a raised road profile with two bridges (spanning two miles and one mile, placed at two of the four deepest sloughs within Northeast Shark Slough). In 2007 a design refinement led to another plan revision to reflect an increase in the amount of land acquisition needed. The federal Water Resources Development Act of 2007 (the first in seven years) provided funding for the Tamiami Trail modifications, but Congress also asked the Corps to reanalyze the modifications in light of significant increases in construction costs. In early 2008 the Corps yet again revised the plan and eliminated the two-mile bridge (thus leaving the one-mile bridge at the eastern corner of the ENP expansion area). The Miccosukee filed a lawsuit claiming that planning for the Tamiami Trail modifications did not follow the National Environmental Policy Act (NEPA) requirement to consider a range of alternatives, with the Miccosukee contending that a cheaper and faster means of improving flow to Northeast Shark Slough would be to build swales and clean the highway culverts. The Miccosukee were also concerned about the economic impacts of the bridge on tourism-oriented tribal and other private lands along the highway.[48] In late 2008 a federal judge agreed with the Miccosukee and placed an injunction on construction of the bridge. In spring 2009 Congress included language in the Omnibus spending bill that exempted the project from the federal law and directed the Corps to begin construction immediately.

*6.2.3.3 Combined Structural and Operational Plan (CSOP)*

The third major aspect of the Modified Water Deliveries Project was the Combined Structural and Operational Plan, consisting of the Water Control Plan for the MWD and C-111 projects and the MWD Project's Conveyance and Seepage Control Features.[49] The Conveyance and Seepage Control Features included structures to allow flow from WCA 3A to WCA 3B (across L-67 A and C levees and canals) and a pump to collect seepage in the north-south canal between WCA 3B/ENP and development (see Figure 4). Like the 8.5 SMA and Tamiami Trail components of the MWD Project, the CSOP has also been subject to debate and revision. Because of the controversial nature of CSOP planning, it has employed two collaborative processes to negotiate technical/agency and stakeholder aspects, respectively.

In 1996 Everglades National Park questioned whether the L-67 conveyance components were sufficient to allow anticipated restoration flows, but a 1999 study by the National Park Service found that they were. In early 2001 the Corps issued a Value Engineering Report for the MWD Project, as required by law for large projects. The report recommended design changes to the L-67 features, an interim pump to control WCA 3B seepage, and additional conveyance across the levee adjacent to Tamiami Trail.[50] At the District's request, the Corps formed the interagency CSOP Project Delivery Team and began planning the CSOP to address the changes to the Conveyance and Seepage Control Features, to develop the Water Control Plan, and to refine the C-111 Project.

In early 2003 the Corps issued the Draft CSOP Overview and Project Purposes and Objectives, and the Everglades Coalition criticized the document as focusing more on flood protection than ecological restoration. At the request of the Corps, the South Florida Ecosystem Restoration Task Force convened the stakeholder-based CSOP Advisory Team to provide consensus recommendations to the agencies. In late 2006, with support of the CSOP Advisory Team and additional input from the District, the Corps selected a CSOP alternative that balanced ecological and flood control objectives. In early 2007 the Corps began preparation of the CSOP environmental impact statement but put the effort on hold following changes to the Tamiami Trail modifications.

Achieving any environmental benefit of the Modified Water Deliveries Project requires completion of the 8.5 SMA partial acquisition and flood mitigation system, the Tamiami Trail modifications, the Conveyance and Seepage Control Features, the C-111 Project, and the Water Control Plan. The current estimated date for completion of this suite of components is 2013.

### 6.2.4 The Comprehensive Everglades Restoration Plan

The Central and Southern Florida Project Restudy, guided by multiple collaborative processes from 1992 to 1998, recognized that the so-called "foundational" projects, including the Modified Water Deliveries Project and the C-111 Project were not enough to revive the southern Everglades. The Restudy sought ways to restore the entire remaining Everglades, and the result was the Comprehensive Everglades Restoration Plan (CERP). Several CERP projects aimed to improve sheetflow, reduce seepage losses, and enable more natural flow volumes and timing in the Shark Slough area.[51] Soon after CERP was presented, however, the U.S. Department of the Interior and the Florida Game and Fresh Water Fish Commission, determined that the plan did not substantially restore historic Everglades flows, and the South Florida Ecosystem Restoration Working Group concurred. During implementation, again guided by multiple collaborative processes, the bias away from environmental improvement and towards water supply planning has become even more pronounced.

The main CERP project to improve Everglades flow regime was the WCA 3 Decompartmentalization and Sheet Flow Enhancement (Decomp) Project.[52] The Decomp Project included components to further enhance flow across L-67 A and C and Tamiami Trail (along the entire northern border of Everglades National Park and including the adjacent levee and canal). The Decomp Project also proposed to fill Miami Canal, with expansion of the North New River Canal between WCA 3A and WCA 2A to maintain water supply (see Figure 3). The Decomp Project was to be completed in two phases, with the first phase authorized in 2000 and covering changes to Miami Canal and the portion of Tamiami Trail across Northeast Shark Slough.

The Decomp Project Management Plan was issued in early 2002, but several months later the Corps and District suspended planning as a result of delays in the MWD Project and other CERP projects, resistance by recreational fishing interests who use the Everglades canals, and uncertainties about the ecological impacts of project features.[53] Several years later in 2006, under pressure for CERP to achieve environmental gains, the interagency RECOVER group developed the Decomp Adaptive Management Plan (DAMP) to address the planning hurdles caused by scientific uncertainty.[54] The agencies also segmented the project components into three phases (rather than two), and the Decomp Project Delivery Team reconvened in late 2006 to pursue the first phase which included burying Miami Canal (rather than backfilling it to reduce cost), a flow-way for

L-67A, and a bridge for the western portion of Tamiami Trail (between two of the S-12 gates). Around this time, the South Florida Ecosystem Task Force convened a subcommittee to provide input to Decomp Project planning.

The long-term plans for restoring Shark Slough and its headwaters are ambitious, but there are serious concerns over whether and when these plans will come to fruition. Past multi-purpose projects, such as the Experimental Program, have led to development gains (e.g., improved flood control) at the expense of the environment (e.g., drying of adjacent wetlands). Other projects, such as the Modified Water Deliveries Project, have required frequent revision and conflict resolution, thus taking decades to become functional. Even with completion of the MWD Project, significant improvements in Shark Slough flow must wait for the Decomp Project and other CERP projects to reduce seepage losses (in order to increase restoration flows and mitigate flood risk to developed areas east of the large north-south levee). The timeline for implementation of these projects is likely decades.

Table 5 lists the major events in the Shark Slough case. For each event, the table indicates the primary type of governance process involved or resulting (collaborative, political, bureaucratic, judicial, or scientific), or whether it was an environmental change.

Table 5 Chronology of Major Events in the Shark Slough Case

| Date | Event | Type |
|---|---|---|
| 1905 | Idea for Everglades National Park first suggested | P |
| 1912 | Miami Canal completed | E |
| 1928 | Tamiami Trail highway completed | E |
| 1947 | Everglades National Park created | B |
| 1948 | C&SF Project authorized and DOI first requested water delivery schedule for ENP (but not done) | B |
| Early 1950s | District studied pre-C&SF Project flow to Shark Slough, and Corps noted C&SF Project deliveries would not meet ENP's needs | S/B |
| 1962 | Water Conservation Area 3 completed | E |
| 1964 | ENP determined and requested minimum flow from Congress | S/B/P |
| 1965 | First ENP water delivery schedule (based on WCA 3A water level) established | B |
| 1965 | Corps' Survey-Review initiated | B/C |
| 1966 | C&SF Project connected to the C-111 System | E |
| 1967 | L-67C and L-67 Extension constructed | E |
| 1968 | ENP-South Dade Conveyance System authorized | B |
| 1970 | Congress passed ENP's Minimum Delivery Schedule | P |
| 1973 | Groups petitioned Dade County to place moratorium on East Everglades development | P |
| 1978 | ENP first considered restoration of flow to Northeast Shark Slough | B |
| 1978 | East Everglades Resources Planning Project | C |
| 1980 | First Corps "restudy" conducted | B |
| 1982 | WCA 3B airport site study committee convened | C |
| 1983 | ENP's Seven Point Proposal submitted to District | B |
| 1983 | East Everglades farmers lawsuit initiated (and then mediated) | J/C |
| 1983 | Experimental Program authorized | B |
| 1984 | East Everglades/ENP Resources Planning and Management Committee convened | C |
| 1985 | State pledged to purchased undeveloped land in East Everglades | B |
| 1987 | District requested Corps develop the C-111 Project | B |
| 1988 | East Everglades Land Acquisition Task Force | C |

Table 5 (continued)

| Date | Event | Type |
|---|---|---|
| 1989 | ENP Protection and Expansion Act passed, including Modified Water Deliveries and C-111 projects | B |
| 1990 | Experimental Program impacts on snail kite mediated | C |
| 1992 | Modified Water Deliveries plan issued | B |
| 1992 | C&SF Project Restudy initiated | B/C |
| 1994 | C-111 Project plan issued | B |
| 1994 | ENP Protection and Expansion Act amended, including potential acquisition of 8.5 SMA | P |
| 1994 | East Everglades 8.5 SMA Study Committee | C |
| 1996 | ENP first expressed concerns about MWD Project Tamiami Trail and L-67 conveyance components | B |
| 1997 | U.S. Fish and Wildlife Service urged Corps to protect Cape Sable seaside sparrow (led to mediation and ISOP/IOP) | B/C |
| 1998 | District supported full acquisition of 8.5 SMA | P |
| 1999 | Miccosukee and homeowners sued District and SERA over 8.5 SMA acquisition decision | J |
| 2000 | Corps selected alternative for Locally Preferred Option for 8.5 SMA | B |
| 2000 | Decomp Project authorized by CERP | B |
| 2001 | Corps issued Value Engineering Report for MWD Project and recommended changes to MWD Project conveyance and seepage components | B |
| 2001 | CSOP Project Delivery Team initiated | C |
| 2001 | Landowners sued Corps claiming agency did not have authority to implement 8.5 SMA alternative | J |
| 2002 | Congress stated it intended for Corps to implement 8.5 SMA alternative | P |
| 2003 | CSOP Advisory Team convened | C |
| 2003 | Tamiami Trail modifications plan issued and withdrawn | B |
| 2005 | Tamiami Trail modifications plan revised (two bridges) | B |
| 2006 | Decomp Project's Adaptive Management Plan issued | C |
| 2006 | Decomp Project Delivery Team reconvened | C |

Table 5 (continued)

| Date | Event | Type |
|---|---|---|
| 2006 | South Florida Ecosystem Restoration Task Force formed ad hoc Decomp Project team | C |
| 2008 | Tamiami Trail modifications plan revised (one bridge) | B |
| 2008 | Miccosukee sued over Tamiami Trail plan | J |
| 2008 | 8.5 SMA partial acquisition and flood mitigation system completed | E |
| 2009 | Congress exempted the Tamiami Trail modifications plan from federal law | P |

Type: C – collaborative process, P – political process, B – bureaucratic process, J – judicial process, S – scientific process, E – environmental change

This chapter concludes the case backgrounds and chronologies. The remainder of the dissertation presents the analytic findings to explain the role of collaboration in Everglades restoration.

### 6.3 Notes

[1] Steven M. Davis and John C. Ogden, eds., *Everglades: The Ecosystem and Its Restoration* (Delray Beach, FL: St. Lucie Press, 1994).
[2] Shark Slough was eleven miles wide (at Tamiami Trail) and consisted of several interconnected smaller sloughs and ridges.
[3] National Research Council, "Does Water Flow Influence Everglades Landscape Patterns?" (Washington, DC: The National Academies Press, 2003).
[4] Carlos Alverez, Michael Eng, and Analee Mayes, "Assessment of Opportunities for Multi-Stakeholder Collaboration on the Environmental Impact Statement for the Combined Structural and Operational Plan for Modified Water Deliveries to Everglades National Park and C-111 Canal Projects" (Tucson, Arizona: U.S. Institute for Environmental Conflict Resolution, 2002), http://www.ecr.gov/pdf/everglades_final_report.pdf (accessed August 20, 2009).
[5] Joel I. Wagner and Peter C. Rosendahl, "History and Development of Water Delivery Schedules for Everglades National Park through 1982" (South Florida Research Center, National Park Service: Homestead, Florida, 1987).
[6] National Research Council, "Does Water Flow Influence Everglades Landscape Patterns?"
[7] Ibid.
[8] National Research Council, Committee on Independent Scientific Review of Everglades Restoration Progress, *Progress Toward Restoring the Everglades: The First Biennial Review* (Washington, DC: National Academies Press, 2006), http://www.csis.msu.edu/Publications/Restoring_the_Everglades_2006.pdf (accessed August 16, 2009), 44.
[9] Ibid.
[10] Flow was over 2.3 million acre-feet to the west of Shark Slough in 1995 alone. ; South Florida Natural Resources Center, Everglades National Park, "An Assessment of the Interim Operational Plan" (National Park Service, 2005).
[11] Ibid.
[12] Ibid.
[13] The 2008 reevaluation of the Tamiami Trail modification may require CSOP to be renegotiated and thereby delay implementation.
[14] Planners chose the eastern section to bridge based on least cost (because of soil conditions) and disturbance of businesses and residences. U.S. Army Corps of Engineers and U.S. Department of the Interior, "Modified Water Deliveries to Everglades National Park Tamiami Trail Modification Limited Reevaluation Report and Environmental Assessment, Draft" (April 2008), http://www.saj.usace.army.mil/dp/mwdenp-c111/ (accessed July 21, 2008).
[15] U.S. Army Corps of Engineers and South Florida Water Management District, "Central and Southern Florida Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" (1999), http://www.evergladesplan.org/pub/restudy_eis.cfm#mainreport (accessed January 30, 2006). ; Matthew C. Godfrey, "River of Interests: Water Management in South Florida and the Everglades, 1948-2000" (U.S. Army Corps of Engineers, 2006).

[16] In 1938 DOI biologist Daniel Beard also recommended that the park include land north of Tamiami Trail to protect flow. Grunwald, *The Swamp*.
[17] Ibid.
[18] 315,000 acre-ft per year for Shark Slough and Taylor Slough combined.
[19] The wildlife deaths (deer herd) in 1966 prompted a petition to "Save the Florida Everglades," including concern with habitat impacts of a proposed canal (L-67C) to provide water to ENP by capturing seepage. Landscape impacts of high water levels in the central Everglades, such as loss of tree islands and conversion of marshes and prairies to sloughs, were apparent by 1970.
[20] The recommended canal expansions were to provide water to Taylor Slough (via connecting the L-67 Extension to the C-111 system) and west of Shark Slough (via extension of L-28), and channels south of Tamiami Trail to better distribute flow to ENP. U.S. Army Corps of Engineers, "Survey-Review Report: Water Resources for Central and Southern Florida" (1968).
[21] Another infrastructure expansion initiative, the Southwest Dade County Project, intended to further enhance water supply to agriculture was authorized in 1965, but it lacked a local sponsor and was deactivated in the 1970s and deauthorized in 1990. East Everglades 8.5 Square Mile Area Study Committee, "A Report to Governor Lawton Chiles" (April 1995), http://library.stu.edu/dl/pdf/a125_001-012.pdf (accessed August 20, 2009), 7.
[22] Senator Holland agreed to this exception to state sovereignty in order to help preserve his legacy of the park. Grunwald, *The Swamp*.
[23] Godfrey, "River of Interests," 174.
[24] Ibid, 177.
[25] East Everglades 8.5 Square Mile Area Study Committee, "A Report to Governor Lawton Chiles."
[26] Grunwald, *The Swamp*.
[27] Godfrey, "River of Interests," 258-59.
[28] The groundwater drawdowns were continued until 1988 when Dade County constructed a large water supply well in the area.
[29] The funds were not appropriated. Godfrey, "River of Interests," 265.
[30] Ibid, 263.
[31] Kathleen Shea Abrams, Hugh Gladwin, Mary Jean Matthews, and Barbara McCabe, "The East Everglades Planning Study." In *Collaborative Planning for Wetlands and Wildlife: Issues and Examples*, edited by Douglas R. Porter and David Salvesen (Washington, DC: Island Press, 1995).
[32] Godfrey, "River of Interests," 270.
[33] The Experimental Program and planning for the MWD Project had resulted in the recommendation that the operational plan for the MWD Project be the "modified rain-driven plan."
[34] In the federal Working Group's first annual report published in December 1994, an appendix stated that Corps restoration projects were stalled because of difficulties in quantifying environmental benefits and conflicting agency positions. In September 2006 the National Academies of Science independent review panel found that restoration of

flow in the southern Everglades delayed because of reluctance to make trade-offs between tree islands (WCA 3B) and ridge-and-slough (ENP) and water quality concerns.

[35] ENP believed that during storms, the developed areas would pressure the District to operate the system for flood protection. East Everglades 8.5 SMA Study Committee, "Meeting Summary" (September 22, 1994), 2-3.

[36] Godfrey, "River of Interests," 255 and 387. ; East Everglades 8.5 SMA Study Committee, "Meeting Summary, "4 ; Litigation testimony (various) http://www.law.miami.edu/library/everglades/ (accessed April 9, 2007).

[37] Although the ENP Protection and Expansion Act directed the Corps to provide the 8.5 SMA with flood protection, the 1992 plan for the MWD Project committed to construction of a flood mitigation system, since full protection or buy-out were not "economically justified." U.S. Army Corps of Engineers, "General Design Memorandum and Environmental Impact Statement: Modified Water Deliveries to Everglades National Park" (Atlanta, GA: Corps, 1992), 42-47.

[38] River of Interests suggested that the move was to strengthen state-federal partnership, by giving the federal government something in preparation for the Restudy. ; The DOI denied withholding funds for the reason of 8.5 SMA flood mitigation and instead blamed 1992 Hurricane Andrew damage. ; Godfrey, "River of Interests," 386.

[39] Godfrey, "River of Interests," 388. The concern about such delays was within reason given the difficulties the agencies were experiencing at the time with acquisition of agricultural properties under the Emergency Interim Plan for Florida Bay of 1994. There was also speculation that the Miccosukee also wanted to avoid takings precedent for restoration. During the 1998 emergency deviation higher than average rainfalls created high water levels in WCA 3A, but there remained technical debate whether the limited flow through the S-12s contributed to the high water levels (ENP claimed the system was able to divert all the water that would have normally been released through the S-12s).

[40] And in 1999 FWS issued a Biological Opinion with Reasonable and Prudent Alternative. U.S. Fish and Wildlife Service, "FWS Biological Opinion" (2008), http://hpm.saj.usace.army.mil/csssweb/frame1/fwsopinion.htm (accessed May 3, 2008).

[41] Ibid.

[42] Early concern for the impact of the Experimental Program on the sparrow occurred in 1995 in the Taylor Slough area.

[43] The Miccosukee (and agricultural interests) sued the Corps in 2000 and 2002 claiming violation of the National Environmental Policy Act, the Endangered Species Act (because of impacts to the endangered snail kite in WCA 3A), and other laws. In 2006 the Miccosukee sued the FWS for failure to conduct adequate consultation on the IOP Supplemental Environmental Impact Statement and issuance of an Incidental Take Statement for the Snail Kite.

[44] The District did not notify the 8.5 SMA residents of condemnation meetings.

[45] The last lawsuit over the 8.5 SMA occurred in 2001 after collaborative planning produced the final flood mitigation system design (known as Alternative 6D) when residents sued the Corps claiming they did not have authority to implement a plan that did not protect all the area from flooding. In 2003 Congress authorized implementation of Alternative 6D.

[46] T. Van Lent, Snow R.W. and James F.E., "An Examination of the Modified Water Deliveries Project, the C-111 Project, and the Experimental Water Deliveries Project: Hydrologic Analyses and Effects on Endangered Species" (Homestead, Florida: South Florida Natural Resources Center, Everglades National Park, 1999).
[47] The letter led to: Science Coordination Team. "The Role of Flow in the Everglades Ridge and Slough Landscape," 2003. http://www.sfrestore.org/sct/docs/SCT%20Flow%20Paper%20-%20Final (accessed January 30, 2006).
[48] Gene Duncan, "Miccosukee Tribe's Comments on the Sky-Way Proposal for the Tamiami Trail," (Presented to the Miami-Dade Metropolitan Planning Organization, March 22, 2007).
[49] U.S. Army Corps of Engineers and National Park Service. "Public Meeting and Scoping for Conveyance and Seepage Control Features: Modified Water Deliveries to Everglades National Park Project," PowerPoint presentation, November 20, 2008.
[50] U.S. Army Corps of Engineers and South Florida Water Management District, "Central and Southern Florida Project Comprehensive Everglades Restoration Plan Project Management Plan: WCA-3 Decompartmentalization and Sheet Flow Enhancement Project Part 1" (2002), http://www.evergladesplan.org/pm/pmp/pmp_docs/pmp_12_wca/decomp_main_apr_2002.pdf (accessed March 30, 2006).
[51] Additionally, the Lower East Coast Water Supply Plan since 1997 included features to improve Everglades flow, particularly designation of Minimum Flows and Levels and Everglades Rain-Driven Operations for the WCAs, but the impact of these features was small.
[52] Corps, "Decomp Project Management Plan."
[53] The 2000 Water Resources Development Act stipulated that funds for constructing the Decomp Project would not be made available until the completion of the MWD Project.
[54] DAMP Leadership Team. "Using Adaptive Management to Meet the Challenges of Decompartmentalization: DECOMP Adaptive Management Plan (DAMP)." PowerPoint presentation, April 6, 2006. https://my.sfwmd.gov/pls/portal/url/ITEM/41BCA18D9BB87F82E040E88D495221A2 (accessed August 20, 2009).

# THE ROLE OF COLLABORATION IN EVERGLADES RESTORATION

VOLUME II

By

Kathryn Irene Frank

# CHAPTER 7

# INTEGRATIVE TENET

The literature review and conceptual framework presented in Chapter 2 recognized three tenets of ecosystem management. The ecosystem management approach is (1) integrative across the ecosystem and connected with smaller and larger scales of management, (2) adaptive in the face of changing conditions and information, and (3) protective of ecological health and other values. The first tenet affects the second tenet, and the first two tenets have implications for the third tenet. Indicators for these interrelated tenets form the basis for evaluating collaborative processes and collaborative governance (i.e., the combined action of collaborative, political, bureaucratic, and judicial processes). The most important evaluative comparison is between the impacts of collaborative processes/governance relative to what would have likely happened without collaboration. Also of interest are the impacts relative to ideal collaborative processes/governance, including process quality or contextual reasons for any discrepancies. The dissertation reports the findings for each tenet in separate chapters, beginning with this chapter.

Additionally, the literature review identified three, interrelated types of impacts of collaborative processes: (1) process characteristics, including problem solving and conflict resolution, (2) outputs, including policies, coordination, and political support for policies, and (3) capacity building and political restructuring. Each of the findings chapters is thus organized according to the types of collaborative process impacts, as they relate to each tenet. The presentation of impacts in each chapter thus progressively expands in social-environmental and temporal scales. The findings from the phosphorus and Shark Slough cases are presented together as a cross-case analysis. Table 6 shows the organization of the findings chapters.

Table 6 Organization of Findings Chapters

| **Ecosystem Management Tenets** | **Collaborative Process Impacts** | | |
|---|---|---|---|
| | **Process Characteristics** | **Outputs** | **Capacity Building and Political Restructuring** |
| Integrative | Chapter 7 | | |
| Adaptive | Chapter 8 | | |
| Protective | Chapter 9 | | |

This first findings chapter describes the impacts of collaborative processes on the degree of governance integration relative to the needs of reducing the phosphorus and Shark Slough flow regime threats. Ecosystem management directs governance integration according to an ecosystem's ecological and social conditions and interactions. Decision making processes, policy outcomes, institutions, and group interactions can be more or less integrative in accordance with an ecosystem and across scales. The components to be integrated include stakeholder values and objectives, information, governance activities, and social relationships and alliances. Some forms of governance integration are represented by the concepts of social, intellectual, political, and organizational capital (see Chapter 2). Governance integration is expected to improve environmental decision making and policy implementation, because it reflects important ecosystem components, interactions, and information. This expectation of improvement holds for governance of specific threats to ecological health, such as the phosphorus and Shark Slough flow regime disturbance threats in the Everglades.

The results for the integrative tenet are presented below according to the impacts of process characteristics, outputs, and capacity building and political restructuring. Overall, the research found that collaborative processes increased governance integration beyond what would have likely been achieved through the traditional processes alone, but that the degree and kinds of integration fell short of collaboration proponents' expectations. Specifically, collaborative processes were strongly political and less analytically or communicatively rational than assumed. For government to function, the integration of stakeholder positions into policies via stakeholder participation in decision making was the key to conflict resolution and building political support, and this function was collaboration's forte. Collaborative processes thus conducted holistic information gathering and problem solving to the degree needed to resolve conflict and build political support. Collaborative processes simultaneously advocated multiple values (i.e., environmental, economic, and social), recommended compromise solutions and multi-purpose projects, and promoted consensus building over competition. Collaborative processes were also advantageous from a bureaucratic perspective, because they enabled efficient public outreach and interagency coordination, and alternative cross-scale working relationships. The combined effect was greater bureaucratic control and political competence, especially by the South Florida Water Management District. The combined effect for other interests was improved access to information and decision making, and stronger working relationships between individuals from diverse groups. The use of collaborative processes decreased, but did not squelch, criticism of government actions.

Across governance, collaborative processes raised the profile of Everglades restoration in the public consciousness and built an ethic of setting limits on human sequestration of natural resources. The implications of integration for adaptation and protection of ecological health are incorporated into the discussions in Chapters 8 and 9, respectively.

**7.1 Process Characteristics**

This section examines the integrative impacts of the motivations behind the convening of collaborative processes, how the processes were conducted, and policy precursors such as the development of integrated understanding and the promotion of diverse values. The findings for process characteristics lead into the process outputs and systemic changes covered in Sections 7.2 and 7.3, respectively.

7.1.1 Process Creation, Participants, and Activities

Collaborative leadership and authority usually came from the highest levels: the governor's office (via executive orders), the state legislature (via legislation, either specifically mandating collaboration or enabling it), the District Governing Board (reflective of gubernatorial appointments), and the federal administrative cabinet. Government leaders, especially within the bureaucratic system, convened collaborative processes for the expressed purposes of integrating information and values concerning environmental problems, and increasingly to consider the overall watershed, primarily to resolve conflict and build support for policies. Prior to the use of collaboration in South Florida, such as during planning of the massive Central and Southern Florida Project, governance achieved support for policies and projects the traditional way, through bargaining and horse trading, building of coalitions, and promises to satisfy all major interests or dole out sufficient compensation. These elements remained within collaborative processes, but with added efficiency, trust, legitimacy, and communicative rationality. Other motivations included improved problem solving, better administrative efficiency, and greater control over the policy agenda. Secretary of the Interior Bruce Babbitt's creation of the South Florida Ecosystem Restoration Task Force, for instance, was in part driven by an interest in unifying and strengthening the federal agencies' position for the C&SF Project Restudy. Moreover, the initiative required substantial federal funding for planning and implementation, and Congress would only authorize this funding if it believed that the Restudy/CERP was in the federal interest, was noncontroversial and bipartisan, and had strong state support. Likewise, a main impetus for the Governor's Commission for a Sustainable South Florida was to rebuild the relationships that had been damaged during the phosphorus litigation in preparation for a united front in support of the Restudy. Finally, the Water Resources Advisory Commission was formed early in implementation of the Comprehensive Everglades Restoration Plan in order to have "everyone at the table" to avoid citizen lawsuits over the District's restoration policies.[1]

Early collaborative processes were intended to bring diverse agency experts, scientists, and select stakeholders together to understand and solve complex environmental problems. This was also a time when society viewed technical expertise as objective and highly legitimate, and able to provide effective and lasting solutions. Examples include the Governor's Conference on Water Management (1971), the Special Project to Prevent the Eutrophication of Lake Okeechobee (1973), and the East

Everglades Resources Planning Project (1978). To illustrate, for the East Everglades process, consultants to an interagency steering committee conducted “numerous technical, economic, and social planning studies in the East Everglades” and gathered input from citizen advisory panels.[2] The steering committee’s proposed management plan was the first to paint a picture of the highly interconnected hydrology and multiple values present in the area.

The privilege afforded to technical panels to make policy recommendations faded in the 1990s and 2000s for a number of reasons. Society in general became more aware of the subjectivity of science and technical expertise. The performance of past technical panels was mixed, since the problems were more challenging than originally thought and required greater analysis of social, political, and institutional aspects (whereas technical panels tended to focus on the physical sciences), and some conflicts could not be resolved by better information alone. And the politics around the issues became highly developed and contentious, and governmental and interest groups would not allow further loss of control of the agenda and fragmentation of power by turning decision making over to scientists. During this time policy makers emphasized the distinction of science as value-free in order to argue for technical panels to resolve questions of fact alone and not make policy recommendations. Reference to this distinction became pronounced following the unwelcomed advocacy of the South Florida Ecosystem Restoration Working Group/Science Coordination Team’s Federal Objectives report in 1993.

After the dominant agencies (mainly the District and Corps) gained greater competence with the ecosystem’s physical complexity, leaders’ interest in integration usually stemmed from the desire to resolve conflict and build support for policies, thus allowing the agencies to continue with their work and meet their objectives. When requesting a stay on the federal phosphorus litigation to allow mediation, Governor Lawton Chiles exclaimed, "much more could be accomplished if the state and federal governments put their heads together, utilize their respective scientific, administrative and legal talents to work out a joint solution to these problems, instead of directing their energies and talents at great expense to the taxpayers to the burdens of protracted litigation."[3] In the Shark Slough case, for example, Chiles' executive order creating the East Everglades 8.5 SMA Committee stated, "It is in the public interest…[to] mutually develop a long-term resolution to the conflicts relative to restoring water flow to the Park and Bay and existing land uses in the 8.5 square mile area." And as Corps leaders stated in interviews, the use of collaboration for the C&SF Project Restudy was primarily driven by the Corps desire that the Restudy be perceived as "new and different," because the Corps reputation as "the bad guys" would not have led to the necessary cooperation for such an ambitious initiative.[4]

The desire to resolve conflict and build support largely dictated process participants and activities. Collaborative processes varied widely with respect to who participated and the specific process objectives, and this affected the kind of integration that resulted. Collaborative processes, however, had to adhere to a minimum level of stakeholder inclusion and integrative problem solving, according to collaborative best practices, to remain viable and legitimate. The Governor's Commission for the Everglades illustrated the need for appropriate collaborative practice. The GCE used majority voting with participant representation biased towards economic interests, and as a result some members expressed lack of trust and equal participation, and the process dissolved after only six meetings.[5] Collaborative process participants varied depending upon the type of process, such as technical panel, stakeholder advisory panel, mediation, and coordinating group. Mediations, for example, tended to be narrowly representative (i.e., limited to lawsuit participants), whereas ecosystem level coordinating groups were often very broadly represented (although each process had participant biases). Participants also varied by virtue of the problem addressed, institutional constraints (e.g., the Federal Advisory Committee Act (FACA)), and other goals of the conveners, including the desire to control the policy agenda. The FACA open process requirement, for instance, led to the disbandment of the Southern Everglades Restoration Alliance after the Miccosukee filed a lawsuit against the group for excluding them from meetings. Collaborative process designers tended to separate technical consultations from policy negotiations, and intergovernmental committees from nongovernmental stakeholder panels. The CSOP Advisory Team membership, for example, was nongovernmental for voting purposes. Governance leaders also created separate collaborative processes at different scales, with ad hoc short-lived planning for specific issues at one end of the spectrum, and ecosystem level ongoing coordination at the other end.

Collaborative processes were conducted according to a cross between the motivations for convening (and participating) and professional best practices. Collaborative processes brought groups together in ways that the traditional governance systems did not, i.e., face-to-face and concurrently across a diverse constituency, and focused on negotiating policy issues. Collaborative processes performed planning and implementation functions, i.e., they gathered and analyzed information, sought broader public input, developed recommendations, and oversaw the institution of policies.

Planning and implementation functions, i.e., technical and institutional capacity for problem solving, are typically considered major activities of the bureaucratic system. Collaborative processes performed these functions because they were institutionally flexible and able to address special problems for which the existing agencies were not suited, as well as to support collaborative consensus building functions. Collaborative processes, whether ad hoc or ongoing coordinating groups, frequently incorporated scientific and technical information presented by participants, including agencies and stakeholder groups. A common analytic practice of collaborative groups was to form issue sub-groups. The Water Resources Advisory Committee, for example, increased its policy-recommending productivity by convening many "issue workshops," a cross between collaboration and traditional agency public involvement meetings. Thus, much of collaboration's technical analyses were actually coordination with the bureaucratic system, where agencies gathered and analyzed information and drafted plans, with collaborative committee review. Collaborative technical analysis, however, was not identical to bureaucratic problem solving. According to one participant of the technical mediations for the phosphorus lawsuits, "the people in the negotiation team were technically unqualified to design the wetlands, and it would have been better if they had gone through the normal public works process, with plenty of opportunity for public review and comment."[6]

Although integration was a major intention, collaborative processes, due to their emphasis on conflict resolution and building political support, were not strongly rationalized according to ecosystem management (i.e., holistic and comprehensive), despite some leaders' statements and process goals to the contrary. The ecosystem level collaborative groups of the 1990s, for example, had broad mandates for ecosystem restoration and regional sustainability, but the focus was on advising and overseeing the C&SF Project Restudy. The ecosystem level collaborative processes avoided the controversies of the phosphorus and Shark Slough flow regime threats, even though these threats were considered the most important to resolve for ecosystem health. Collaborative processes' aversion to strong leadership on behalf of ecosystem health occurred because the processes had multiple objectives and depended on the support of conveners and diverse participants.

### 7.1.2 Integration of Information

Collaborative processes were attuned to concerns of relative group power, political feasibility, and process viability and were thus incremental in their gathering, acknowledgement, and incorporation of new information and issues. Ecosystem management requires attention to information that has long term significance, but this involves greater uncertainty, opportunity costs of expanding attention, and impacts on future (not current) leaders. Ecosystem management thus requires institutional structures and incentives that collaborative processes alone could not provide.

The first Lake Okeechobee Technical Advisory Council (LOTAC I), for example, recommended diversion of nutrient laden flows without considering the ecological impacts on the receiving areas, including the Everglades. Upon its release, LOTAC I's report was greatly criticized in public. Similarly, in the Shark Slough case, the East Everglades 8.5 SMA Study Committee report did not mention the detrimental effect of canal operations on the Cape Sable seaside sparrow even though the Natural Resources

Defense Council was corresponding with the District over the issue.[7] A few years later the sparrow issue would dominate Shark Slough governance. The South Florida Ecosystem Restoration Task Force, the collaborative process most intended for ecosystem management, struggled to keep ecological health as the main goal of restoration as other collaborative processes and forces drove governance towards a regional orientation more integrated with development concerns. As of 2009, after 16 years in operation, the Task Force had not yet reported measurements of indicators of ecological health. Such a report was eminent, however the indicators, such as bird populations, were too integrative to be useful for policy making regarding specific threats.[8]

Collaborative processes primarily contributed to moderate information integration, sharing, and legitimacy. LOTAC II's Interim Report, for example, publicly stated what had been known since the mid 1970s, that "ecological changes [were] occurring in the Everglades marsh adjacent to points of discharge from the EAA," and that "left unchecked, these impacts could spread throughout the Water Conservation Areas and the marsh within Everglades National Park." And, contrary to the District's position, LOTAC II holistically noted that the District's Interim Action Plan had only increased phosphorus load to the WCAs by 15% and that there had been "an existing nutrient loading problem." In terms of information sharing, the District explained that the mediated phosphorus negotiations provided the agency with "a clearer understanding of the needs and interests of the parties and the options available for addressing [the] complex problem."[9] Similarly, a governance leader in the South Florida Ecosystem Restoration Task Force commended the District's Water Resources Advisory

Commission for bringing recreational values to the attention of federal restoration planners (especially as they related to the Decomp Project). At the ecosystem level, a key role of the South Florida Ecosystem Restoration Working Group and Science Coordination Group was to synthesize and repackage groundbreaking scientific understanding and critiques of restoration in order to add legitimacy and reach a wider audience. The "Federal Objectives Report" prepared by the Working Group's Science Sub-Group in 1993, for instance, reflected the holistic ecological understanding that had emerged with the first Everglades Symposium sponsored by the District and ENP in 1989 and associated edited volume, *Everglades: The Ecosystem and Its Restoration*.[10]

The phosphorus case contained a few instances of collaboration bogging down with inaccurate scientific claims, however this also occurred in the traditional systems. The Scientific Advisory Group for the Everglades (SAGE) spent most of its year of meetings considering alternative technologies proposed by the sugar industry, as the industry maintained its judicial posturing within collaboration, however the group finally asserted that Stormwater Treatment Areas were the only viable option (in addition to agricultural best management practices). The Technical Oversight Committee assisting implementation of the Everglades Program could not agree on whether the federal standard or state phosphorus criterion was more ecologically protective.

One process, the Governor's Commission for a Sustainable South Florida, was uncommonly integrative in the sense that the process convinced diverse groups of their interdependencies, thus leading them to accept major reform of the water management infrastructure. The common ground, however, was more dependent on political agreement than conditioned on long-term ecological health. The common ground was thus tenuous as social and political winds changed, especially in the fact of technological and funding limitations, a fact that came as a surprise to many who had the false impression that agreement was rooted in ecological health.

On the whole, though, collaborative processes' integrative efforts maintained a higher level of analytic rationality (although still subject to strategic communications), especially when stakeholder competition was the fiercest and subject to greater political distortions. The ecosystem level collaborative processes helped keep the goal of balanced ecosystem restoration, i.e., including ecological health, on the governance agenda during periods of less supportive leadership (such as the Jeb Bush and George W. Bush administrations). Chapter 9 elaborates on the connections between governance integration and the protection of ecological health.

### 7.1.3 Promotion of Diverse Values

The promotion of diverse values is a form of governance integration that had implications for policies, capacity building, and political restructuring. The frequency at which governance leaders solicited assistance from collaborative processes depended not only upon the degree to which technical problems, fragmentation, conflict, and power dynamics stymied the traditional systems but also the leaders' desire to better integrate environmental goals into policy making. Florida governors often stated a desire to find balance between economic and environmental values when they convened collaborative processes. At the ecosystem level, Governor Reubin Askew kicked off the first collaborative process, the Governor's Conference on Water Management in South Florida in 1971, by telling participants that he wanted to "build a peace between the people [of South Florida] and their place."[11] Twelve years later, Governor Bob Graham said, "although the [Everglades] system can never be the same as it was before [drainage], many of its natural functions and values can be restored while providing water supplies and flood protection to south Florida."[12] Collaborative processes were well suited to reinforce this multi-valued perspective.

Collaborative process statements expressed support for diverse and seemingly conflicting stakeholder values, the hope that technical design could meet multiple needs, and the advantages of collaboration and holism. The vision was often one of regional sustainability in which human activities coexisted with a stable, desirable environment, rather than ecological health per se. The Governor's Commission for a Sustainable South Florida defined sustainability for South Florida as "adequate water quality, flood protection, and water supply for agriculture and urban areas as well as the natural system." The integrative value statements functioned to mainstream environmental protection while strengthening political support for restoration policies. Collaborative value statements were generally non-threatening to economic interests, however, because they were inclusive of them, satisfied environmentalists, and were sufficiently vague, hollow, redundant, or malleable.

Examples from the phosphorus case illustrate the tendency of collaborative processes to promote diverse values. Early, technically oriented collaborative processes were bold in their criticism and calls for threat reduction, but the political repercussions quickly led to tempered statements. The first collaborative process to directly address the EAA phosphorus threat, LOTAC II (1988), pointedly advocated a plan "to prevent violations of applicable State water quality criteria," yet spread the responsibility by explaining, “This is not a case of recalcitrant polluters; this is a situation where an unwanted side effect of beneficial public and private efforts must be corrected through public and private efforts.”[13] A goal of the first draft Everglades SWIM Plan, developed with input from two collaborative processes, was to “protect and improve the natural resources of the [WCAs] as an integral part of the Everglades system, while maintaining the multiple functions of the WCAs.” The 1991 Settlement Agreement, which resolved the federal phosphorus lawsuit, differed from every other collaborative statement in that it focused entirely on environmental values. This is compared to the federally led Statement of Principles two years later that declared, “The Everglades is a wetland and wildlife resource unique in all the world,” yet added, “By [draining the Everglades], we have sought to provide a healthy, attractive living environment for millions of people safe from flooding and other natural forces; and to provide a base for a flourishing agricultural industry that provides important products, jobs, and income regionally and nationally.”

Inclusive collaborative value statements were also nonthreatening to all interests because collaborative processes promoted the belief in creative, win-win solutions. Collaborative process recommendations tended to overestimate implementing agencies’ technical capacity to simultaneously meet diverse stakeholder needs. The Comprehensive Everglades Restoration Plan, for example, made many assumptions that did not prove accurate, including the most fundamental premise that CERP could recover enough water for the growing urban areas and the environment. The complexity of the issues and accompanying uncertainties permitted agreement, with each party hoping to have the upper hand in the long run. Indeed, collaborative agreements and consensus statements were usually advisory and at best represented an informal contract. The division of collaborative labor also enabled consensus building based on overly optimistic expectations. Collaborative processes found agreement by assuming that some other process, collaborative or traditional and occurring either simultaneously or in the future, would develop a creative solution that meets seemingly incompatible stakeholder needs. As the first independent oversight committee under the National Academies of Science, Committee on the Restoration of the Greater Everglades Ecosystem (CROGEE) noted, “Building broad stakeholder support for the program has been achieved in part by promoting goals and targets that may not be entirely achievable or even internally consistent.”[14] Everglades National Park, however, remained skeptical of the promises of collaboration and its agreements, since it had suffered repeated broken promises, unintended consequences, and slippery slopes beginning with the authorization of the C&SF Project under the guise of meeting multiple objectives. As a result, other parties branded ENP “not a team player” and “only concerned about the park” during many of the collaborative processes in which it participated.

Traditional governance also declared diverse values, yet the accompanying fragmentation and competition of these approaches created a more realistic sense that there would be winners and losers. Towards the end of the case studies, governance leaders were beginning to realize that a sustainable balance between environment and development was more challenging than originally thought – that “restoration” projects could not keep up with development’s demands for more resources and that ecological health would require even greater concessions from development.

## 7.2 Outputs

7.2.1 Policies and Their Political Support

Collaborative process outputs include policies and their political support (another type of output, coordination, is addressed in the next subsection). Most collaborative process policy recommendations were correspondingly integrative, representing compromise positions between the disputing parties or proposing multi-purpose projects. Independent of the collaborative system, a "consensus politician" was occasionally able to craft bi-partisan legislation or an agency restructured itself to address multiple values, but these approaches were more difficult to achieve on a consistent basis. In comparison, many considered the widespread solidarity and support for the Comprehensive Everglades Restoration Plan during its approval process in Congress to be the most significant achievement of the Governor's Commission for a Sustainable South Florida.[15] In another example, the Miccosukee Tribe criticized the District's decision to acquire the 8.5 SMA as going against "three commissions."[16] Groups also argued against policies created non-collaboratively, even though the traditional processes were legal. At a South Florida Ecosystem Restoration Working Group meeting, for instance, a member complained that the Amendment to the Everglades Forever Act was "an end-run around local government, the Working Group, Task Force, WRAC, and public participation, and the process resulted in a breach of confidence."[17]

The quintessential compromise solution proposed by collaborative processes was the East Everglades 8.5 SMA Study Committee's recommendation for acquiring half of the 8.5 SMA and providing flood protection for the other half. Previous collaborative processes for the East Everglades had sought win-win solutions that were later deemed technologically and socially unattainable, and the compromise solution was recognition of this reality. The evolution of restoration in the East Everglades is possibly a preview of the path that implementation of the Comprehensive Everglades Restoration Plan will take as groups come to realize the limits to technologies, budgets, and social controls.

As the paragraph above suggests, collaborative processes often resolved disputes by creating multi-purpose projects by adding features to satisfy participants, under the assumption that the features would not significantly detract from the benefits of existing features. In other words, mutual benefits were sought through the expansion of problem definitions and solution boundaries. For example, the Stormwater Treatment Areas to reduce phosphorus were designed with features to improve sheet flow. The keystone assumption during development of the Comprehensive Everglades Restoration Plan, and one heavily promoted by governance leaders and collaborative processes in order to build political support for the plan, was that multi-component redesign of the water management infrastructure could be a mutual gain for all interests. More broadly, collaborative processes assumed that technology and funding would become available to resolve the disputes, or that policies would work as envisioned.

Such multi-purpose projects were attractive from a consensus building perspective, for without them agreement would be much more difficult, but they were problematic during detailed design and implementation as the true timetables, project interdependencies, and interactions between features (and societal reactions to them) became known. ENP/East Everglades Resource Planning and Management Committee (RPMC), for example, recommended construction of a flood protection system for the 8.5

SMA, with design to handle a one-in-ten-year flood event (the standard for the District), provided it was compatible with efforts to restore flow to Northeast Shark Slough.[18] This was later found to be technically impossible (and believed to be so prior to the RPMC's analysis). Collaborative processes also overestimated the power of governmental controls of society. The RPMC, for instance, requested a guarantee from Miami-Dade County and District that flood protection would not set a precedent for further development beyond the 8.5 SMA, even though the county had been unsuccessful in regulating growth of the area in the past.

A particular problem was prioritization of the economic development features during plan formulation and implementation, to the delay of environmental features and increasing threats to the environment. The Experimental Program in the Shark Slough case, for example, left some areas of the East Everglades drier than before the program in order to reduce flood risk to development. The Comprehensive Everglades Restoration Plan was frequently criticized for moving ahead with projects that provided urban water supply while the plan's primarily environmental projects languished. This phenomenon occurred because economic and governmental interests dominated at all times, during and after collaborative processes. The incremental policy and planning progress achieved through collaborative processes was not as environmentally productive as it first seemed (see Chapter 9 for further discussion). Despite this pitfall, Everglades National Park's persistent advocacy and a series of collaborative processes to resolve the associated tensions, for example, were able to gradually shift restoration plans towards greater ecological benefits for Shark Slough.

### 7.2.2 Coordination

Coordination is a less demanding form of negotiation in order to integrate decision making for greater governance efficiency and efficacy. Associated with coordination are information sharing and proactive conflict resolution. As the executive director of the South Florida Ecosystem Restoration Task Force said, "the strength is in the ideas."[19] Coordination thus affects the integrative aspects of policy outcomes, capacity building, and political restructuring.

Interagency coordination at the sub-regional and ecosystem levels was an explicit function of several collaborative processes in South Florida. At the sub-regional level, the Southern Everglades Restoration Alliance (SERA) formed to coordinate the interrelated restoration projects resulting from Everglades National Park's Seven Point Proposal (initiated 13 years prior to SERA). At the ecosystem level, the Kissimmee-Okeechobee-Everglades Coordinating Committee for Save Our Everglades resulted from a summit of state agencies involved with South Florida restoration projects. The Lower East Coast Regional Water Supply Plan initiative merged with the C&SF Project Restudy in order to improve coordination between the two and reduce duplication of effort. Major purposes of the South Florida Ecosystem Restoration Task Force and Working Group included "to promote and facilitate coordinated Federal actions to restore the South Florida Ecosystem."[20] Not all ecosystem-level groups were intended for coordination, however. The Water Resources Advisory Commission composed of numerous agency and stakeholder groups, for example, primarily served as a forum for public input to the District's Governing Board (whereas the WRAC's issue workshops were more oriented towards problem solving).[21] Information sharing and conversations during all collaborative processes, however, affected coordination. Ongoing collaborative processes thus varied in the degree of coordination they provided, with some coordination significantly affecting policy (as with SERA and the Restudy/LEC Plan process) and others (such as Save Our Everglades) being less active.

The fact that high-level officials usually convened collaborative processes to deal with special environmental challenges or opportunities meant that the processes deviated from the traditional hierarchical structure, allowing communication between the high-level officials and mid-level staff jumping across chains of command and organizational boundaries. As noted in *River of Interests* (2006, p. 304), "Although Task Force members would delegate most of the effort to the Interagency Working Group, such attention to an ecosystem by so many senior officers in the executive branch of government was unprecedented," and this eventually produced "significant tensions." Governmental and interest group observers of collaboration were at times concerned about particular collaborative processes or groups gaining too much policy making influence and political cohesion, and thus the observers resisted further attempts by the processes to enhance their status. As a District representative told the South Florida Ecosystem Task Force (led by the U.S., Department of the Interior), the latter should "respect the processes already in place."[22] At other times, however, gaps between governance scales were evident. The South Florida Working Group regularly commented that communication between it and the Task Force was inadequate.

The purpose of improving coordination (and other aspects of administrative efficiency) was the least compelling of the reasons for convening collaboration. As such, many coordinating processes were relatively weak, at least in a direct, short-run sense.

Without strong leadership such processes avoided politically contentious issues and tended to provide support for implementation as opposed to creative or proactive planning. The high-level political support and organizational strength of the Task Force and Working Group (such as possessing an executive director, advisors, and staff), for example, led the group to be fairly productive with respective to the politically safer activities of scientific and governance capacity building at the ecosystem level. These groups, however, had relatively little influence on governance of the phosphorus and Shark Slough threats.

## 7.3 Capacity Building and Political Restructuring

Beyond directly making policy recommendations, collaborative processes changed governance integration in ways that affected future policy making. Sections 7.1 and 7.2 suggested the mechanisms for changes in integration that would be observable at the governance scale, such as through the building of political, intellectual, social, and organizational capital, and political restructuring (i.e., changes in strategic behaviors and relative power). The most observable systemic impacts were changes in governance alliances and beliefs, networks and agency power, scientific consensus, and civic capacity.

### 7.3.1 Collaborative Alliances and Beliefs

Collaborative processes' focus on conflict resolution and building political capital expanded political alliances in support of multi-purpose projects. In particular, collaborative processes promoted the beliefs that multi-purpose projects were possible and that a unified front was necessary to achieve broader political support and therefore funding. This was especially true regarding the Comprehensive Everglades Restoration Plan for which some (but not all) environmental groups resisted public criticism of the plan that was increasingly seen as favoring economic development. Collaborative processes furthermore published statements critical of adversarial approaches such as litigation.[23] This effect did not, however, substantially squelch the range of stakeholder advocacy and use of adversarial strategies such as litigation, the main ways that stakeholders asserted their power. The solidarity formed during the Restudy, for instance, did not prevent Everglades National Park from declaring the plan as "not restoration" (during its consideration by Congress) and the Sierra Club from withdrawing its support of the plan (a few years into CERP implementation).[24] During CERP implementation, members of the Everglades Coalition debated the merits of multi-purpose projects and political solidarity, and a rift formed between "hard liners" and "compromisers."[25]

### 7.3.2 Collaborative Networks and Reinforced Agency Power

Collaborative processes' face-to-face communication and promotion of respectful, productive relationships enhanced flexible governance networks beyond political alliances. Several collaborative processes reported that they restored relationships damaged by previous adversarial processes, such as with the sparrow crisis and phosphorus litigation, and to have created more positive perceptions of opposing groups.[26] The ENP/East Everglades Resource Planning and Management Committee, according to *River of Interests*, "sowed good will among the many parties.[27] Collaborative processes also affected the ability of groups and individuals to work together by promoting beliefs in the benefits of integrated values, the potential for win-win solutions, the necessity of compromise and shared adversity, and the superiority of collaborative decision making. Evidence of the strength of intergroup relationships was the great extent to which individuals changed employment affiliation across ecosystem groups (such as from the District to Everglades National Park, or from the Corps to the Miccosukee Tribe).

The group of participating individuals was small compared to the entirety of governance actors, thus limiting the network building impacts of collaborative processes. This occurred because the recurring set of collaborative participants reflected the major players as well as those groups that were collaboration-friendly, i.e., able to participate and reach agreement, such as the moderate national environmental groups (e.g., the Audubon Society). The participants in collaborative processes, as in traditional processes, thus often remained the same. In the phosphorus case, even with expanded stakeholder participation in the lawsuit mediations and several District-convened panels, John observed that, "More than one person told me I could learn the whole story by talking to fewer than twenty people." The ENP/East Everglades Resource Planning and Management Committee, for example, created the Southern Everglades Technical Committee (SETC), consisting of many of the same members.

Despite the relationship building, without strong leadership for collaboration, groups tended to fragment back to their traditional turfs and instrumental alliances. The Task Force "lessons learned" self-reflection in 2003 cited participant parochialism as a major cause of the collaborative group not producing greater restoration benefits.[28] And the explicit organizational linkage between the ongoing cabinet-level Task Force and agency-level Working Group did not result in significant communications between these two groups. To offer another example, as late as 2006 the Inspector General for the Department of the Interior found that the Modified Water Delivery Project had been ineffective in part because of insufficient coordination between the DOI and Corps. Interestingly, the report recommended a hierarchical (not distributed or collaborative) governance structure to remedy the problem.[29] Likewise, the District's Basin-wide Feasibility Studies managed to keep a low profile for several years prior to amendment of the Everglades Forever Act.

Collaborative processes integrated public concerns into decision making; however the processes also gave governance leaders and the dominant agencies greater control of the policy agenda and enhanced their legitimacy. After passage of CERP, the ecosystem collaborative processes functioned akin to traditional public participation, whereby the powerful agencies largely controlled the agenda and information dissemination, and the conversation served to publicly vet policies, with the powerful agencies informally taking the feedback into consideration. The ecosystem coordination meetings provided an opportunity for non-insiders (i.e., those representing the less powerful groups) to ask pointed questions and express their opinions, but in matters concerning the two threats of interest for this dissertation, the exchange did not appear to make much difference. Several persons interviewed for this dissertation stated that the conversations where the most important decisions were made occurred outside the formal collaborative meetings, between the few agencies and jurisdictions with the main responsibility for policy institution. As governance gained experience with collaboration and open government laws, political leaders and government agencies and jurisdictions learned how to draw the legal line between public collaboration and private conversations, by institutional design to avoid the Sunshine law or fall under exemptions. For example, implementation of the Comprehensive Everglades Restoration Plan occurred under a partnership between the Corps and District, including the high-level CERP Quarterly Review Board composed of the partner agencies and others agencies at times to discuss issues and project status. The Quarterly Review Board was highly influential of CERP implementation, yet it did not hold public meetings or publish minutes, because the partnership was considered intra-agency. The Miccosukee wrote in an appendix to the Task Force's Strategic Plan (2006), "The Tribe has attended more than a decade of meetings on the Everglades Restoration plans…The Tribe fears that the public process, much like the Task Force process, is often used *pro forma* to give an appearance of public involvement."

The collaborative spirit, however, was apparent within instrumental alliances and strategic outreach. An informal environmental network, the "Barley Group," held informational and coordinating conference calls every week, and the larger, formalized Everglades Coalition hosted annual high-profile conferences. In terms of strategic outreach, the group representing Everglades recreational fishers, for example, developed an approach to educate and communicate with environmental groups over the issues of concern (i.e., removal of internal Everglades canals). Collaboration within the scientific community is discussed in the next subsection.

### 7.3.3 Greater Scientific Consensus

A special type of network is the scientific community, and its goal is to continuously update understanding as indicated by scientific consensus. Collaborative processes aided scientific consensus by synthesizing scientific information, coordinating scientific studies, and encouraging broader scientific collaboration, including through conferences. The first Everglades Symposium was jointly sponsored by Everglades National Park and the District for the purpose of advancing scientific understanding of the ecosystem's health, restoration goals, and issues in conflict. The scientific community continued to collaborate to produce a compilation in 1993, and the new South Florida Ecosystem Restoration Task Force's Science Coordination Team further synthesized the information. The agencies and Science Coordination Team maintained regular Everglades Symposiums and issue-specific conferences such as on avian ecology. The collaborative RECOVER group developed the Decomp Project's adaptive management plan that will direct experiments to better understanding the ecological impacts of removal of barriers to sheet flow. Additionally, the Scientific Coordination Team, as well as other groups such as the Technical Oversight Committee and the Congressionally-mandated CERP oversight (CROGEE and CISRERP), provided communication conduits between scientists and policy makers. The two reports by the Committee on Independent Scientific Review of Everglades Restoration Program (CISRERP) have been especially effective in refocusing restoration concern on ecological improvements. The ability of the Task Force and the Department of the Interior to coordinate science, however, has been limited by political resistance, primarily from the District.[30] Many important scientific questions remain unanswered

With regard to the impact of collaboration on scientific inquiry, there was also the prospect that collaboration facilitated the development and enhanced legitimacy of "scientific" information from new sources, such as stakeholder groups, and the related "consensus science." Collaboration did not significantly prompt stakeholder-originated science beyond that required for effective negotiation. The sugar industry, for instance, had formed its Environmental Quality Committee in 1963 in order to provide scientific input into a state legislative debate regarding regulating the practice of field burning. Since that time the sugar industry sponsored and used its science to argue its case in political, bureaucratic, and judicial forums. The collaborative system provided a means to openly debate special interest science; however politics continued to cloud agency search for administrative rationality.

### 7.3.4 Intellectual Capacity through Education and Observation

Collaborative processes increased the intellectual capacity of governance actors through the communication of information to participants and observers (most collaborative processes were open to the public). Collaborative processes included many presentations about environmental and social conditions, policy responses, and group activities. Face-to-face negotiations gave participants greater understandings of each other, group power and positions, and opportunities for agreement than were possible using traditional interactions. As to be expected, the presentations were also vehicles for groups to communicate and advocate for their interests, either overtly or indirectly. This was especially true for the dominant agencies (the District, Corps, and Department of Interior). Despite the process inclusion and transparency, Everglades restoration was disconnected from the larger societal consciousness and culture of South Florida, with even those constituent groups most affected, such as residents of the 8.5 SMA, not understanding the basic premise of restoration.

### 7.4 Notes

[1] Personal interview for dissertation, May 2004.
[2] East Everglades Resources Planning Project, “Proposed Management Plan for the East Everglades” (Metropolitan Dade County, South Florida Water Management District, and Everglades National Park, 1980).
[3] DeWitt John, *Civic Environmentalism: Alternatives to Regulation in States and Communities* (Washington, D.C.: Congressional Quarterly, 1994).
[4] Matthew C. Godfrey, “River of Interests: Water Management in South Florida and the Everglades, 1948-2000” (U.S. Army Corps of Engineers, 2006), 402.
[5] Governor’s Commission for the Everglades, “Meeting Minutes” (various dates), http://www.everglades.state.fl.us/ (accessed March 2, 2007).
[6] John, *Civic Environmentalism*.
[7] Godfrey, “River of Interests,” 382-83.
[8] RECOVER. “Comprehensive Everglades Restoration Plan System-wide Performance Measures.” http://www.evergladesplan.org/pm/recover/eval_team_ perf_measures.cfm (accessed June 26, 2006).
[9] South Florida Water Management District, “Everglades Restoration Annual Progress Report” (January 1994).
[10] Steven M. Davis and John C. Ogden, eds., *Everglades: The Ecosystem and Its Restoration* (Delray Beach, FL: St. Lucie Press, 1994).
[11] Godfrey, “River of Interests,” 138.
[12] Ibid, 181.
[13] Lake Okeechobee Technical Advisory Council (LOTAC II), “Interim Report to the Florida Legislature” (February 29, 1988), 23.
[14] National Research Council, *Adaptive Monitoring and Assessment for the Comprehensive Everglades Restoration Plan* (Washington, DC: National Academies Press, 2003), 3.
[15] Personal interview for this dissertation.
[16] South Florida Ecosystem Restoration Task Force, “Meeting Minutes” (various dates), http://www.sfrestore.org/tf/minutes.html (accessed August 20, 2009).
[17] South Florida Ecosystem Restoration Working Group, “Meeting Minutes” (various dates), http://www.sfrestore.org/wg/minutes.html (accessed August 20, 2009).
[18] Kathleen Shea Abrams, Hugh Gladwin, Mary Jean Matthews, and Barbara McCabe, “The East Everglades Planning Study.” In *Collaborative Planning for Wetlands and Wildlife: Issues and Examples*, edited by Douglas R. Porter and David Salvesen (Washington, DC: Island Press, 1995).
[19] Personal interview for this dissertation.
[20] According to the interagency agreement that created the Task Force in 1993.
[21] Personal interview for this dissertation.
[22] South Florida Ecosystem Restoration Task Force, “Meeting Minutes.”
[23] Such as in South Florida Ecosystem Restoration Task Force and Working Group biennial reports.
[24] Michael Grunwald, *The Swamp: The Everglades, Florida, and the Politics of Paradise* (New York, NY: Simon & Schuster, 2006).

[25] Grunwald, *The Swamp*.
[26] Personal interview for this dissertation.
[27] Godfrey, "River of Interests," 267.
[28] South Florida Ecosystem Restoration Task Force, "Meeting Minutes."
[29] U.S. Department of the Interior, "Modified Water Deliveries to Everglades National Park: Audit Report" (No. C-IN-MOA-0006-2005. Washington, DC: Office of Inspector General, 2006).
[30] South Florida Ecosystem Restoration Task Force, "Meeting Minutes."

# CHAPTER 8

# ADAPTIVE TENET

This chapter is the second of three to report the findings of the impacts of collaborative processes on ecosystem management. This chapter describes the impacts of collaborative processes on the adaptive tenet. Adaptive governance responds to changing conditions and new knowledge, promotes social learning, and evolves institutions. Ecosystem management calls for governance to adapt at various scales, including at the scale of governance of specific threats, in order to maintain ecological health and other values.

The adaptive tenet requires governance learning at different levels, from instituting specific solutions to environmental threats (single-loop learning), to addressing root causes and governance approaches (double-loop learning), to transforming the underlying paradigms about what constitutes a desirable social-ecological system and good governance, and changing governance's capacity for useful learning at any level (triple-loop learning). Moreover, given current trends and stresses on ecosystems, learning at all levels must happen quickly in order to avoid irreversible loss of ecological health and other valuable system attributes. Complex, adaptive systems theory suggests that learning at the lower levels happens faster and leads to slower learning at the higher levels.

Collaborative processes for Everglades governance affected the degree of learning, relative to what would have occurred without collaboration, at each of these levels. The expanding levels of adaptation roughly correspond to the expanding levels of impacts of collaborative processes, from process characteristics and outputs to capacity building and political restructuring. Some of the impacts reported for the integrative tenet in Chapter 7 have implications for the adaptive tenet, and the discussion is extended here.

Overall, the research found that collaborative processes allowed policy making to occur sooner than with traditional processes alone (single-loop learning). The resulting policies represented "low hanging fruit" and incremental environmental improvements over previous policies. Collaborative processes favored multi-purpose projects, and implementation of environmental features, however, lagged behind that of economic ones. Collaborative processes facilitated the generation of new knowledge and its dissemination, especially towards a holistic perspective and scientific consensus (double-loop learning), however, these changes had little impact on governance of the phosphorus and Shark Slough flow regime threats. At the governance level, collaborative processes enhanced the legitimacy of partnerships and agency discretion, thus improving adaptive capacity beyond typical bureaucratic constraints (triple-loop learning). Collaborative processes failed to question fundamental assumptions, since they focused on achieving consensus for implementable policies, or they were so loosely coordinating that actors did not have the incentive to consider alternative perspectives presented (such as during public comment). The improved networks described for the integrative tenet, however, had the potential to eventually bring alternative perspectives into the mainstream, provided governance maintains its diversity over the long run.

## 8.1 Process Characteristics

The lowest level of adaptation (single-loop learning), i.e., responding to environmental threats, requires problem recognition, advocacy, problem solving, and policy implementation and enforcement (the policy cycle). The impacts of collaborative processes on the policy cycle are covered in this section and the next (Section 8.2: Outputs).

### 8.1.1 Responsive Decision-Making

In the Everglades, governance actors primarily used the traditional, including scientific, processes to recognize environmental threats, advocate their reduction, and develop specific solutions. Governance leaders convened collaborative processes when the traditional processes were inadequate, such as when leaders were faced with substantial crises, conflict, criticism, and risk.

Collaborative processes primarily aided the policy cycle in these situations by creating opportunities for policy advancement sooner than would have been possible with traditional processes alone, and by building political support for the negotiated agreements. The flexibility and legitimacy of collaborative processes, combined with the justifications of emergency conditions or extra-jurisdictional status (thus suggesting the need to work together), allowed governance leaders to quickly convene collaborative processes tailored to the problems. This occurred on several occasions such as when an interagency committee reviewed the District's C-111 Interim Plan to address the negative effects of the Experimental Program of Water Deliveries on estuaries downstream of the C-111 system. Expedited negotiations also occurred to develop new operational protocol to address the U.S. Fish and Wildlife Service's biological opinion for the Cape Sable seaside sparrow that found the need for considerable changes in operation of the water management infrastructure in order to prevent species extinction. Such special, expedited processes necessarily limited participation, especially to agencies, in order to act swiftly.

Collaborative processes also enabled faster governance response when conflict prohibited traditional bureaucratic planning, such as happened during formulation of the Everglades SWIM Plan and policies concerning the East Everglades. In this regard, collaboration broke through impasse and conducted the technically demanding work of analysis, negotiation, and crafting of mutually acceptable and sound agreements. Associated with the collaborative planning approach was the public vetting of policies that also occurred with traditional agency-led public participation. Collaboration thus provided tailor-made planning services with enhanced stakeholder access and buy-in to address the particular concerns of governors, the state legislature, or the District, and so on. President George W. Bush, for instance, thanked the East Everglades Land Acquisition Task Force for "doing two years worth of planning for the [Everglades National Park Protection and Expansion] Act."[1]

Another barrier to communication and joint analysis was the toll of conflict on the ability of people to work together. This occurred during the height of interagency efforts to reach agreement on operations to protect the sparrow. As dialog became increasingly polarized and alarmist, with species extinction pitted against catastrophic infrastructure failure, interpersonal and interagency relationships became so damaged that professional conflict resolution and facilitation services were needed to overcome this barrier to cooperation.

As time went on, however, collaborative processes were more often used proactively for high profile planning processes when the powerful groups possessed a degree of flexibility, such as when deciding how to use the U.S. Sugar Corporation land the District proposed to purchase (but, flexibility was *not* the case, for example, when the District was technically, financially, and politically unable to meet the federal phosphorus standards by the deadline, so very little collaboration occurred). The ongoing ecosystem level collaborative processes gave governance the capacity to quickly and frequently form stakeholder "workshops." It should be reiterated, however, that the dominant groups (primarily the District) largely determined what issues to present for consideration by the workshops.

### 8.1.2 Controlling the Agenda

Governance leaders used collaborative processes to solve political or bureaucratic problems as well. Governor Bob Graham created the ENP/EE Resource Planning and Management Committee to counter the threat that Miami-Dade County would relax its land use policies for the East Everglades under pressure from private interests in the area.[2] Graham thus asserted his political agenda to restore the Everglades by convening a collaborative process that by design would likely yield policy recommendations desired by Graham, but with an administrative framework and legitimacy that went beyond that which the governor could have accomplished independently. As early as 1986, the District viewed collaboration as a means to stay involved in decision making and maintain some control, rather than leaving it to the courts or legislature to decide, as stated in a report summarizing the District's response to the controversy following the

LOTAC I report and large algae bloom in Lake Okeechobee.[3] In another instance, during the federal phosphorus lawsuit, the Department of Justice countered the District's attempt to form a rift between the federal agencies by leading negotiations to produce joint federal comments on the draft Everglades SWIM Plan.[4] Organizations also used collaboration to avoid having to make a decision, such as when the Corps deferred identification of the preferred alternative for the 8.5 SMA flood mitigation project to an interagency committee.

Beyond the direct diversion of the policy making process to collaboration, the creation of collaborative processes had symbolic value indicative of initiative, leadership, and authority. Collaborative processes suggested group status by virtue of who convened, facilitated, and participated in the processes. Some observers of the Task Force saw its creation as a move by the Department of the Interior to improve its status and become a leader for South Florida restoration, while others were concerned with the more broadly federal presence.[5] Some persons interviewed for this dissertation speculated that the Governor's Commission for a Sustainable South Florida was formed in direct response to the creation of the Task Force a year earlier, in order to provide a state and regional counter-balance to the federal process. Likewise, a similar comment was made about continuation of the state/regional-federal balance of power through the creation of the District's Water Resources Advisory Commission. In the phosphorus case, collaboration appeared to be a concession to the sugar industry. The Statement of Principles negotiated between the Department of the Interior and the sugar industry "pledge[d] to inaugurate an unprecedented new partnership, joining the Federal and State governments with the agricultural industry of South Florida…," and a direct result of this arrangement was the

District's Scientific Advisory Group for the Everglades (SAGE) to assist the District in selecting phosphorus reduction technologies (within which the sugar industry unsuccessfully used this forum to try to steer efforts away from Stormwater Treatment Areas).[6]

8.1.3 Incremental Knowledge Development

Collaborative processes' orientation towards conflict resolution and consensus building meant that collaborative problem solving sought the minimum degree of analysis and system change in order to reach short term agreement among diverse groups; but this was still more than would have been achieved through traditional processes alone. As discussed for the integrative tenet, collaborative processes largely synthesized existing information and found compromises among existing positions. Collaborative processes, however, also generated new information at a finer level of planning detail, with support of resourceful groups' technical capabilities. Technical mediation for the initial phosphorus lawsuits, for example, refined understanding and design of the Stormwater Treatment Areas, whereas the District originally developed the STA approach. The highly technical aspect of restoration meant that the dominant agencies (District and Corps) largely controlled technical planning and asserted their technical superiority in order to maintain their control.

On the whole, collaboration functioned very slowly to resolve scientific uncertainties, because uncertainties and misinformation worked to the advantage of some interest groups (especially the sugar industry). In this regard, science was used strategically to argue for more of less of something, such as acres of Stormwater

Treatment Areas. Agencies and environmentalists wanted more acres, the sugar industry wanted less, and both sides leveraged science during the negotiations. In the end, it came down to acceptability of the overall agreement, rather than finding a true technical answer. As is now widely known, even 42,000 acres of STAs is not enough to prevent phosphorus from degrading the Everglades. Similarly, the performance standard of the agricultural best management practices (BMPs) remained the same from the 1991 Settlement Agreement to the 1994 Everglades Forever Act, a time period that included lawsuit mediations and District-convened roundtable discussions to develop the BMPs regulatory program, even though it is now known that the sugar industry was capable of consistently achieving even greater phosphorus reductions.

In the Shark Slough case, the multiple collaborative processes concerning the East Everglades did not provide the kind of proactive insights that mattered, or could have mattered, the most, especially with respect to social issues and sources of possible conflict, topics for which collaboration should have excelled compared to strictly bureaucratic technical analyses. The East Everglades Resources Planning Project failed to explore the social complexities in the 8.5 SMA and potential challenges of implementing land use controls and Shark Slough restoration, even though the area had an outlaw image since the early 1970s. The ENP/East Everglades Resource Planning and Management Committee and East Everglades Land Acquisition Task Force (1988), primarily stakeholder forums, did not acknowledge the intractability of flood "mitigation" leading to greater expectations and usage for flood protection at the expense of the adjacent wetlands. The East Everglades 8.5 SMA Committee did not broach the sparrow issue that was to dominate policy making in the area beginning in 1998, even though the issue was known since 1980 and had recently been receiving the attention of an environmental organization.[7]

Instead, appreciation of the socio-environmental governance challenges in the 8.5 SMA developed through passive trial and error. To the credit of the ENP/East Everglades Resource Planning and Management Committee, the process report recognized the technical uncertainties of Shark Slough restoration and generally acknowledged the potential for conflict as the nascent Experimental Program moved forward. It was through the Experimental Program's explicit adaptive management approach that the ENP discovered that flood mitigation for the 8.5 SMA was drying out some undeveloped wetlands to a greater extent than had occurred prior to the program. This information compelled the park to withdraw its support for the structural flood mitigation project proposed by the Corps as part of the Modified Water Deliveries Project and to request further study by the District.

As part of the mediations that developed the Interim Structural and Operational Plan (ISOP) and Interim Operational Plan (IOP) to protect the sparrow, the South Florida Ecosystem Restoration Working Group and the American Ornithological Union convened an independent scientific panel to review the sparrow science, and the Working Group continued to host regular avian ecology conferences, but consensus beliefs about the sparrow and its restoration needs remained elusive into the late 2000s.[8] Regarding the unintended environmental side effects of the Interim Operational Plan, they were discovered through a Congressionally mandated study conducted by Everglades National Park.

To respond to criticism and implement best governance practice, the collaborative implementation team of the Comprehensive Everglades Restoration Plan (RECOVER) developed an adaptive management plan for the Decomp Project, however some considered the scale of experimentation insufficient to resolve the uncertainties, while the project was rapidly moving forward with the component designed to increase water supply to South Dade County.[9] In the CSOP Advisory Team's final letter, it emphasized the group's "strong consensus support for the adaptive management approach…however, [the Team] underscored that this will require a sustained commitment…"[10] The Shark Slough experience with collaboration thus illustrated the ability of collaborative processes to not fully explore the issues to enable long-term conflict resolution.

The collaborative system occasionally provided oversight of restoration program implementation and as a result generated new information. In the phosphorus case, the Settlement Agreement formed the Technical Oversight Committee (TOC) to "plan, review and recommend all research, monitoring and compliance" and "make technically based recommendations by consensus approach." At times of exceedance of the phosphorus standard, the TOC recommended changes in operation of the water management system and STAs, or found reasons to ignore the data such as data quality or extenuating circumstances. The TOC did not directly contribute to development of the District's Long Term Plan or the state's phosphorus criterion, and it was a Miccosukee Tribe lawsuit, not the TOC, that was the catalyst for the judicial system to eventually become concerned about whether the phosphorus exceedances constituted violations.

Ecosystem level collaboration, such as during planning and implementation of the Comprehensive Ecosystem Restoration Plan, directed agencies and scientists to gather ecosystem level information, and collaboration reported the results. Much of the ecosystem level information, however, was either not yet obtained (such as in the case of the ecological indicators) or was not very useful for governance to address the two threats of interest.

## 8.2 Outputs

### 8.2.1 Incremental Policy Progress

Collaborative processes achieved incremental policy progress through several means: by finding the points to which groups could agree, by making ambitious assumptions about governance and societal capacity to honor the agreements or satisfy all interests, and by delaying resolution of issues for which consensus could not be reached. Collaborative processes occasionally reached agreement by expanding the problem scope and solution boundaries through incremental addition of components that were not objectionable to other interests (see Chapter 7). It should be noted, however, that the scope expansions did not directly affect governance of the two threats studied for this dissertation. The combination of technical analysis along with attention to political feasibility resulted in recommendations that governance leaders were able to adopt and thus do something to relieve the problems and government gridlock. Collaborative processes achieved the "low hanging fruit" while avoiding the discomfort associated with more dramatic ecological improvements.

Collaborative outputs represented compromises between the existing warring parties and were not especially creative. The phosphorus lawsuit mediations, for example, allowed dialog such that the settlement details could be worked out. The project and program specifications were similar to the initial draft Everglades SWIM Plan. Instead, the enhanced policy (not project) details provided all parties with greater assurances that their needs would be protected. Environmental interests achieved restoration deadlines, oversight, and more funding for projects. The sugar industry, on the other hand, gained approval for the final agreement to be drawn up by the state legislature, where the industry's lobbyists had considerable influence. The result for the sugar industry was a cap on its financial responsibility and a shift away from federal, and towards state, governance.

In an unusual instance of collaboration yielding a solution that had not previously been proposed, the East Everglades 8.5 SMA Study Committee discussed and eventually recommended partial acquisition of the 8.5 SMA to form a buffer between the park and the more developed portion of the area, noting that "full acquisition for purposes of restoration and public management is fairly unrealistic." The solution was, however, a clear compromise, with the Committee specifying that the Corps design the buffer within the 8.5 SMA to "provide opportunities to implement a reasonable level of flood protection for the currently developed or developable areas within the 8.5 [SMA]…to provide the maximum flexibility for re-establishing hydropatterns in Northeast [Shark Slough]…and to minimize relocation of residences."

For the several instances in which solutions could be characterized as "win-win," collaborative problem-solving was sound, but still not exceptionally creative. The initial, strategic insights into opportunities for joint gain occurred outside collaboration. For example, governance leaders believed they could gain political support for an environmental overhaul of the C&SF Project by "expand[ing] the water pie" in order to increase political support.[11] The concepts of ecosystem management (favored by the federal interests) and regional sustainability (favored by state and local interests) provided additional legitimacy.

Occasionally, however, collaborative processes could not achieve consensus on policy recommendations for some issues and thus left it to the traditional systems, or perhaps higher-level collaboration, to resolve. The CSOP Advisory Team, for instance, could not reach consensus on operation of a seepage pump because of the conflict between urban and agricultural desire for flood protection and ENP not wanting urban stormwater runoff pumped into the park.[12] With regard to the flood protection of the 8.5 SMA, the Advisory Team simply stated, "The Corps must meet Congressionally authorized flood protection for the 8.5 SMA and areas east while maintaining Congressionally authorized environmental benefits for ENP." The Advisory Team hoped that future decisions and projects, particularly CERP, would provide opportunities to meet all the team's performance expectations.

Ecosystem level collaboration often made recommendations at a high level of abstraction, and the recommendations were overly optimistic about the potential for implementation, balance, and sustainability. The processes largely shied away from making (or they were not invited to make) specific recommendations on controversial issues that affected the ecosystem, including the phosphorus and Shark Slough threats. The processes instead preferred to reiterate values, share information, and advocate expedited implementation of authorized projects. For instance, even though an intention of the South Florida Ecosystem Restoration Task Force and Working Group was to focus on the Restudy, the groups did not directly engage in the Restudy's plan formulation process until mid-1998 when the Task Force issued its first letter to the Corps as required by Congress. The Task Force letter only recommended major goals for the C&SF Project Restudy, such as "restore hydrological structure and function as well as water quality conditions," "improve water supply," and "flood protection."[13] Meanwhile the ENP and the Florida Game and Fresh Water Fish Commission independently criticized the proposed alternative as grossly inadequate for restoring the Everglades. The Working Group then confirmed that the alternative did not significantly increase overland flow to the park and would result in ecologically damaging high and low water levels in the WCAs, but the Working Group said there was not enough time to resolve the issues before the plan was due to Congress.[14] In 1999 the Task Force issued a second letter to the Corps expressing support for the largely unchanged CERP.

The Governor's Commission for a Sustainable South Florida was more effective at addressing the details and challenges that were necessary to make environmental progress. Every person interviewed for this dissertation attributed the success of the GCSSF to its chair, Richard Pettigrew. The GCSSF input to the Restudy was more frequent, and the group's recommendations for the two threats of interest became more specific over time, including recommendations for adding water quality features, examining methods of seepage control, coordinating with the Modified Water Deliveries and C-111 projects, balancing urban water supply with other needs, the need for "aggressive water conservation measures," and implementation balance.[15] The GCSSF's Report on the Draft Implementation Plan foresaw additional problems with maintaining the environment-development balance during CERP implementation. Each of these points proved to be tragically prescient.

At least one ecosystem-level collaborative group, the District's Water Resources Advisory Commission, was moderately proactive in recommending policies to guard against future threats. The WRAC demonstrated important leadership for protecting Everglades water from future allocations to development, including proposed District rules limiting new consumptive permits and an initiative to increase water conservation across the region, but observers have noted that the leadership was due to more to the WRAC's chair rather than directly from the collaboration. On other issues the WRAC did not show strong leadership, such as when the WRAC recommended that the Decomp Project balance canal fishing needs with restoration of sheetflow, but without specific strategies to do so.

### 8.2.2 Biased Implementation and Political Support

Adaptive governance must balance faithful implementation of policies and projects with their revision in light of new conditions and information. As governmental and stakeholder groups brought forth their issues in the traditional systems, policies, projects, and their implementation evolved. Collaboration had limited ability to shape implementation, since ad hoc collaborative processes usually disbanded soon after making recommendations, and the ecosystem level collaborative processes often lacked the leadership to tackle controversial issues (such as the phosphorus and Shark Slough flow threats). In this context, the implementation of multi-purpose projects, which commonly resulted from collaborative processes, biased economic interests. This occurred despite the enhanced political support for the original, balanced vision for the projects. The commitments and alliances of collaboration were present even decades following specific collaborative processes, but not so strong as to tightly regulate group behaviors for a substantial period of time.

There were many mechanisms for the economic implementation bias, including unpredicted technical-social problems, stronger advocacy of economic interests during implementation, legal/procedural and funding challenges, and changing information. The evolution of the Experimental Program and Modified Water Delivery Project illustrate the several dimensions of governance adaptation. At the level of individual project decisions, or iterations involving collaborative processes, implementation resulted in the reduction of flood risk to development (and strengthening of expectations for additional flood protection) at the somewhat unexpected expense of wetlands. At the level of evolution of the projects, however, collaborative processes facilitated project revision in order to address environmental shortcomings. Collaborative processes were thus involved in creating policies subject to revision and allowing revision to occur.

### 8.2.3 Untested Ecosystem Perspective

At the level of learning to consider root causes of environmental threats and alternative governance approaches (double-loop learning), political and professional/scientific processes generated the most dramatic, creative, and insightful proposals and long-term thinking for the ecosystem, such as the original ideas of ecosystem restoration and the recent proposal to purchase U.S. Sugar Corp. Collaborative processes incrementally and slowly contributed learning at this level, but to a deeply ingrained and widely accepted extent. The integrative aspect of collaborative processes shifted understanding towards a more holistic ecosystem perspective, improving understanding of environmental conditions and governance tendencies, although the perspective was somewhat skewed by strategic communications. Collaborative learning about governance and societal tendencies was the most productive since it was beyond the dominant agencies' capabilities (whereas engineering analyses, under certain assumptions, were their fortes). Collaborative processes led by skilled, objective facilitators that addressed important issues needing consensus yielded the best learning about governance and societal tendencies. Yet, this learning still failed to question fundamental assumptions (as discussed below). Powerful groups could ignore this learning, but perspectives consistently promoted by multiple collaborative processes slowly became widely accepted. In order to enhance legitimacy and satisfy multiple interests, collaborative processes (along with traditional processes) also promoted the use of science and accountability to goals, thus directly supporting scientific conferences and restoration assessment tools (e.g., adaptive management indicators/monitoring, reporting, and independent oversight panels). The restoration assessment tools occasionally prompted strong political criticism and advocacy that led to more ecologically protective policies.

Learning can be a hindrance if too much information, such as from the holistic ecosystem perspective, slows governance down or distracts it from better use of limited resources. The ongoing ecosystem level collaborative process most attuned to ecosystem management, the South Florida Ecosystem Restoration Task Force (and its Working Group), spent much of its time developing the ecosystem perspective without anchoring it to specific problems, thus the value of the ecosystem perspective was not immediately apparent. This ecosystem level information, for example, had no bearing on governance of the two threats of interests during the time period observed. The processes designed to ensure an ecosystem perspective during implementation of CERP, such as the RECOVER team and formulation of the Programmatic Regulations, were also saddled with processing holistic information without immediate payoffs. Likewise, too much decision making process (e.g., collaborative meetings) can slow down and distract governance. Collaborative processes, along with the holistic (ecosystem management) perspective, frequently led to additional collaborative processes, further demanding governance resources. These holistic and collaborative efforts, though, contributed to the slow accumulation of important governance capacity for protection of ecological health (and other values) and used the abundance of governance resources devoted to South Florida restoration without significantly curtailing groups' efforts to serve their interests through targeted initiatives.

## 8.3 Capacity Building and Political Restructuring

### 8.3.1 Adaptive Networks

As discussed for the integrative tenet, collaborative processes expanded and strengthened governance networks across the ecosystem and scales. Such networks in the Everglades provided increased opportunity for interactions, including information sharing and alliance building, thus facilitating loose governance adaptation. Collaborative participants represented a pool of known individuals with which groups could draw for needed actions. For example, a former representative of the World Wildlife Fund who participated on the Governor's Commission for a Sustainable South Florida later joined the District's Governing Board and became the chair of the Water Resources Advisory Commission.

Networks, however, should also possess diversity and redundancy for adaptation. Collaborative processes modified power relations, but governance maintained its diversity of interest groups and governmental fragmentation, including overlaps, despite several coordinating groups' stated objective of reducing duplication of effort. Collaborative processes, however, did little to selectively build the capacity of disadvantaged or unorganized groups. Collaborative processes also enhanced the legitimacy of flexible planning arrangements, thus enabling initiatives such as the state's Acceler8 program that acquired planning control of major CERP projects and avoided lengthy federal bureaucratic procedures.

### 8.3.2 Learning Adaptation

At the level of transforming the underlying paradigms about what constitutes a desirable social-ecological system and good governance (and thereby causing political restructuring), collaborative processes slightly contributed, but also resisted. Collaborative processes provided an additional forum for discussing ideas promoted by key players, and this occasionally included innovative or radical concepts, but for the most part conversations centered on negotiations of concrete, politically feasible actions. To an extent, collaborative conversations reminded the dominant agencies (District and Corps) that they did not have all the answers and hinted to the need for natural infrastructure and flexible projects and policies so that options would be available in the future.

Collaborative processes generally steered clear of debating core values, since the processes instead promoted compatibility of diverse values. Collaborative processes also promoted perspectives conducive to consensus building, such as faith in multi-purpose technical solutions and myths concerning the degree of ecological interdependency among stakeholders, that were not useful for long term conflict resolution. Collaborative processes advocated a collaborative paradigm rather than one that may privilege one interest group over another, such as would be the case, for example, if processes led to a more natural ecological system requiring less human intervention. Governance leaders were increasingly recognizing that economic interests were dominating the collaboratively achieved restoration policies relative to environmental interests, and that ecological health would require greater sacrifices from development. As these perspectives became more widely acknowledged, including through the reports of independent oversight panels, collaborative processes began to reference them, but with only minor adjustments. Perhaps more significantly, several governance leaders with substantial collaborative process experience and credentials used their highly integrated perspectives and reputations to independently advocate stronger governance responses to the new perspectives. Independent reviewers recommended deliberate change in Everglades decision making processes to address issues of uncertainty and experimentation, but much less was said about how to reconcile collaborative processes or other governance processes and institutions with the possibility of greater sacrifices required for ecological health.

## 8.4 Notes

[1] George H. W. Bush, "Statement on Signing the Everglades National Park Protection and Expansion Act of 1989" (December 13, 1989), http://www.presidency.ucsb.edu/ws/index.php?pid=17941 (accessed August 20, 2009).
[2] Matthew C. Godfrey, "River of Interests: Water Management in South Florida and the Everglades, 1948-2000" (U.S. Army Corps of Engineers, 2006), 263.
[3] Patricia A. Bidol and Stephen S. Light, "Innovative Approaches to Managing Water Crises: Alternative Dispute Resolution for Lake Okeechobee" (South Florida Water Management District, no date).
[4] DeWitt John, *Civic Environmentalism: Alternatives to Regulation in States and Communities* (Washington, D.C.: Congressional Quarterly, 1994).
[5] Grunwald, *The Swamp*.
[6] "Statement of Principles" (Signed by U.S. Department of the Interior, U.S. Army Corps of Engineers, South Florida Water Management District, Florida Department of Environmental Protection, U.S. Sugar Corporation, South Bay Growers, Inc., and Flo-Sun Inc., July 3, 1993).
[7] Godfrey, "River of Interest," 382-83.
[8] South Florida Ecosystem Restoration Task Force, "Meeting Minutes" (various dates), http://www.sfrestore.org/tf/minutes.html (accessed August 20, 2009).
[9] South Florida Ecosystem Restoration Task Force, "Meeting Minutes."
[10] CSOP Advisory Team. "Tentatively Selected Plan Consensus Recommendations," April 26, 2006.
[11] Godfrey, "River of Interest." ; Personal interview for this dissertation.
[12] CSOP Advisory Team, "Combined Structural and Operational Plan Advisory Team 23rd Meeting," Draft Facilitator's Meeting Summary, April 25-26, 2006, www.sfrestore.org/issueteams/csop.../meeting_23_042506.pdf (accessed September 20, 2008).
[13] Stuart Langton and Walter A. Rosenbaum, "Historical highlights of the South Florida Ecosystem Task Force" (Florida Center for Environmental Studies, 2000).
[14] Grunwald, *The Swamp*.
[15] Governor's Commission for a Sustainable South Florida, "The Conceptual Plan of the Governor's Commission for a Sustainable South Florida" (Coral Gables, Florida, 1996). ; Governor's Commission for a Sustainable South Florida, "Report on the Draft Implementation Plan for the Restudy" (Coral Gables, Florida, 1998), 27.

# CHAPTER 9

# PROTECTIVE TENET

This chapter examines the impacts of collaborative processes on the third tenet of ecosystem management: protective governance. Ecosystem management must ultimately protect ecological health, while supporting other social values to the extent possible. The focus of this dissertation is on ecological health, since this is the preeminent value for ecosystem management. For the Everglades, protecting ecological health means preserving natural processes and attributes of the native landscape, thereby necessitating elimination of the phosphorus and disrupted flow regime threats for at least portions of the historic wetlands, as well as other threats. Addressing these two threats requires that governance, at a minimum, enact regulatory policies and modifications to the physical infrastructure.

This chapter presents collaborative process impacts on the enactment and implementation of such policies and projects, relative to what would have likely been achieved with the traditional processes alone, as well as governance capacity for future protection. The analysis draws on the integrative and adaptive findings in Chapters 7 and 8, and other findings relevant for the protective tenet. Similar to the preceding two chapters, the results are organized according to process characteristics, outputs, and capacity building and political restructuring.

Overall, this study found that the traditional processes were the most active and therefore primarily responsible for the protective policies (and retreats from them). Collaborative processes mainly resolved conflicts and challenges encountered during the policy cycle. Toward this end, environmental interests were well represented in collaborative processes. The degree to which environmental groups were able to influence protective policies during collaboration was indicated by the processes' recommendations. Collaborative processes recommended compromise and multi-purpose solutions. These solutions allowed policy implementation to incrementally move forward, albeit in revised form, until the next conflict or challenge brought activity to a halt. These solutions, however, also resulted in unintended environmental setbacks during implementation as the limitations of technical fixes came to light and governmental and economic groups dominated over the long run. In terms of capacity building and political restructuring, collaborative processes simultaneously strengthened governmental, economic, and environmental groups through network building and information sharing. Collaborative processes discouraged adversarial approaches, which have been useful tools for environmental interests, but the effect was slight. In total, collaborative processes brought governance closer to ecosystem management in most areas of evaluation, but collaborative governance's politically conservative approach did not result in the magnitude of change needed to restore ecological health in the foreseeable future.

## 9.1 Process Characteristics

Several characteristics are indicative of the extent to which collaborative processes are protective of ecological health and other values: process purposes, participants, communication and analysis, and intermediate products (namely, value statements and information). Whereas the previous two chapters examined process characteristics as they relate to the integrative and adaptive tenets, the discussion below considers the weight placed on ecological health within each of the characteristics.

### 9.1.1 Process Objectives

Chapter 7 described the main reasons that governance leaders convened collaborative processes (i.e., to resolve conflict, solve problems, improve administrative efficiency, and control the policy agenda). A different aspect is a process' a priori policy goal, which had great influence over process output. Many collaborative processes were convened to resolve conflict, and thus the implicit policy goal was to find a balance, or at least agreement, between competing interests. A related policy goal was to plan successful multi-purpose projects, such as the C&SF Project Restudy and implementation of the Comprehensive Everglades Restoration Plan. This contrasts to the policy goal of achieving ecological health, which was the goal of several early, technical collaborative processes. For example, the title of the Special Project to Prevent the Eutrophication of Lake Okeechobee speaks to this goal. At the ecosystem level, Save Our Everglades strove to achieve an "Everglades of the year 2000 [that] looks and functions more like it did in 1900 than it does today." The South Florida Ecosystem Restoration Task Force was intended to ensure that restoration planning attended to federal ecological objectives. The Governor's Commission for a Sustainable South Florida moved the goal further away from ecological health towards the balancing act of sustainability. Collaborative processes were thus dependent upon strong environmental advocacy and traditional processes (such as the passage of legislation and lawsuits) to advance ecologically protective policies.

### 9.1.2 Process Participants

Every collaborative process in the two case studies had participants that represented environmental interests in some capacity, because the conflicts and opportunities addressed were environmental. Environmental values and governmental institutions were diverse, and as such there was a wide range of environmentally oriented groups participating in collaboration. Every group, including environmentalists, had multiple interests, as did the individuals representing the groups. Determining whether participants represented ecological health was thus not a simple matter. Some groups, such as the South Florida Water Management District, explicitly held multiple values. The Miccosukee Tribe advocated policies to improve the ecological health of the central Everglades, but they also were concerned with maintaining their economic and residential activities along Tamiami Trail and broader issues of tribal status and governance precedent. And Everglades National Park, for instance, was criticized for advocating the return of historic high flows to Shark Slough in order to aid coastal estuaries within park boundaries at the ecological expense of the central Everglades. Nor was it easy to evaluate positions in terms of their impacts on ecological health, since it was unknown how groups' proposed solutions would perform given governance, societal, and ecological complexities. The Miccosukee Tribe would argue, for example, that its seemingly anti-environmental positions, including opposition of full acquisition of the 8.5 SMA, construction of the Tamiami Trail 1-mile bridge, and purchase of U.S. Sugar Corporation were more environmentally protective, because they better reflected the limits of government power and resources.

Frequent environmental group participants were the National Audubon Society, Audubon of Florida, World Wildlife Fund, The Nature Conservancy, and National Parks Conservation Association. This set of environmental groups customarily focused on particular environmental values such as wildlife, threatened and endemic species, and national parks. The environmental groups concerned solely with Everglades integrity, such as Friends of the Everglades (formerly the Save Our Everglades non-governmental organization), the Everglades Foundation, and the Marshall Foundation, were not direct participants in collaborative processes, however they occasionally made public comments at collaborative meetings. Collaborative processes were generally open to the public (with the exception of some mediations and high-level interagency coordination) and allowed time for public comment, many of whom were environmental. Nor did leadership of the Everglades Coalition participate in collaboration per se, but the Coalition held sway over whether its member organizations would participate. Additional groups representing environmental values included the Everglades Coordinating Council (association of sportsmen's and conservation clubs) and sub-ecosystem groups (e.g., Florida Keys Fishing Guide Association).

The diversity of environmental values and their organizational representation led to conflicts between environmental interests, such as the Experimental Program to restore Northeast Shark Slough having negative impacts on endangered species (the Cape Sable seaside sparrow and Everglades snail kite), the emergency measures to protect the sparrow negatively impacting the kite, the proposed restoration of historic flow volumes to Shark Slough causing potential flooding of tree islands in WCA 3B, and the WCA 3 Decompartmentalization and Sheet Flow Enhancement Project plan to remove canals that support world-class recreational fishing. Thus not all environmental representatives advocated for reduction of the two threats of interest, and some environmental advocacy competed with these objectives. Collaboration was used to address environment-versus-environment conflicts, as well as the traditional environment-versus-development ones. The prominence of EAA phosphorus and Shark Slough restoration meant that advocates for reduction of these threats were often included in collaborative deliberations.

Because collaboration addressed conflicts between environmental protection and development, stakeholder representation likewise included private development interests such as the sugar industry, South Dade agriculture, 8.5 SMA residents, and the Miccosukee (based on its tribal lands in WCA 3A). At the ecosystem level, pro-growth voices came from local governments concerned with maintaining public water supply and developers. Some agencies were development-oriented, such as the Florida Department of Agriculture and Consumer Services. Public officials and multi-purpose agencies, mainly the District and Corps, represented both environmental and development interests, with strength of positions depending upon their main responsibilities and the political pressures at the time. These officials and agencies tended to favor development, but not exclusively.

### 9.1.3 Communication and Analysis

Environmental, governmental, and economic representatives were each given opportunities for flexible communication. Processes frequently included “whip-arounds,” an open-ended portion of the meetings where each participant was able to comment about anything of importance. Other parts of the meetings were fairly structured, including presentations on specific issues by participants or technical staff and work on tasks such as developing project performance measures. Following presentations, there was time for discussion, and when issues needed more processing, the collaborative groups formed sub-groups to conduct the additional work and report back to the larger groups. A member of the Governor's Commission for a Sustainable South Florida, for example, said, "Every issue that came up [was] a major discussion," and this led to numerous working groups.[1] Other processes were not as deliberative or focused on reaching consensus. The ongoing Technical Oversight Committee, for example, was often split between federal and state/regional agencies regarding controversial technical issues.

Collaborative processes did not have a substantial immediate impact on the relative decision making power of groups, in spite of a common belief in the literature that collaboration "levels the playing field." Facilitators in the Everglades cases worked to make collaborative processes fair, but communications and negotiations remained dependent upon power cues from outside collaboration in order for participants to know what information to accept and to identify options for viable policies.

### 9.1.4 Protective Values Statements and Information

Recalling from Chapters 7 and 8, collaborative processes advocated multiple values. Collaborative statements always included environmental values, but they were vague. And the statements did not address the possibility that values would be in conflict during policy enactment and implementation, thus necessitating limits on development in order to protect ecological health. The legislation authorizing CERP (developed with substantial collaborative guidance), for example, illustrates both points. The legislation declared that the purpose of CERP was “to restore, preserve, and protect the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection.” The simple mainstreaming of environmental values within legislation, however, was a significant achievement.

Chapters 7 and 8 also examined the kind of information generated by collaborative processes. The information represented incremental improvements in holistic understanding, especially in regard to the societal aspects of how policy alternatives would affect stakeholders and how they would respond. In this way, collaborative processes functioned as in-depth public participation for policy vetting. The collaboratively generated information was also important because of its wider acceptance due to the high legitimacy of collaborative processes. This was particularly beneficial for the development of scientific and technical consensus. The information was protective to the extent that it improved the political and social viability of policies. A more holistic consideration of the threats appeared to be environmentally beneficial, but sufficient political and bureaucratic support to truly implement this approach was lacking.

### 9.2 Outputs

The impacts of collaborative processes on the enactment and implementation of protective policies, including improvements in governance efficiency due to coordination, are synthesized in this section according to the bottom line of restoring ecological health.

### 9.2.1 Impacts of Traditional Processes Prior to Extensive Collaboration

The contribution of collaborative processes to ecologically protective policies is best understood relative to, and within the context of, the functioning of the traditional processes. By 1987, traditional processes had laid a foundation of environmentally protective policies and bureaucratic capacity, before the most concentrated use of collaborative processes. Environmental voices were strong in South Florida since the turn of the Twentieth Century because of the region's exceptional environment and the increasingly obvious connections between environmental management and basic ecosystem services such as water supply and clean air. As with creation of Everglades National Park in 1947, the passion and organizing leadership of a few individuals, along with the support of environmental groups and public sentiment, resulted in remarkable environmental victories in the 1960s, such as the defeat of the Everglades jetport. The 1970s saw the passage of numerous statewide environmental laws that provided the legal foundation upon which advocates for threat reduction could force action and upon which the political and bureaucratic systems could act once forced. Following Governor Bob Graham's meeting with restoration advocates in 1981, an aide recalled, "I do not ever remember a time thereafter that the environment was not on the top of the agenda."[2] Significant governance attention to the Everglades phosphorus and Shark Slough flow regime threats arose primarily through traditional processes during the 1980s.[3]

### 9.2.2 Impacts of Traditional Processes in Concert with Collaboration

In the phosphorus case, since the late 1980s, creation and institution of environmentally protective policies occurred through a combination of state legislation, federal judicial action, mediated negotiations, reactionary stakeholder lawsuits, and technical advisory panel input. This combination of governance actions, especially the federal lawsuit, allowed the District to overcome its politically motivated resistance to regulating the sugar industry and take a restoration path that District staff and other agencies had been recommending for years. The sugar industry, however, continued to resist regulation and reduction of its economic base (i.e., land in sugar production), and collaboration gave the sugar industry a direct seat at the negotiating table to work out the economic details of restoration. Collaboration thus not only resolved conflict resulting from the federal intervention to allow significant restoration projects to be implemented, it also allowed the sugar industry to regain a degree of control under conditions of changing societal values. Collaboration thus contributed to the sugar industry convincing the federal government to allow the Florida Legislature to be the primary forum for restoration policy agreement. It was in this forum (but not through collaboration) that the sugar industry ultimately gained the multiple-decade delays in meeting protective standards that the industry needed to continue operations until soil subsidence or changing markets took their toll. The Miccosukee Tribe has since had some success in challenging this legislative reversal of ecological protection in the courts.

Unlike the phosphorus case, Shark Slough water flow regime restoration lacked a powerful legal framework, therefore the majority of advocacy for flow restoration occurred at the mid-level of governance through interagency political-bureaucratic interactions. Since its inception, Everglades National Park strongly advocated for ecologically beneficial inflows to the park through direct communication with the Corps and District. The park's difficulty with securing interagency agreements and the need for substantial restoration funding meant that the U.S. Congress was often the legislative level needed to support restoration. The resulting federally authorized initiatives for restoring Northeast Shark Slough encountered local and interagency conflict during implementation and thus relied on collaboration, combined with additional Congressional action, to resolve conflict and allow incremental project progress. It was the persistent advocacy of ENP, as well as the ecological restoration promises of the C&SF Project Restudy, that caused Shark Slough restoration project scope and designs to evolve. The role of collaboration in redesigning the C&SF Project was primarily as a means of building stakeholder support for the multi-purpose initiative that had gained initial traction through traditional processes.

### 9.2.3 Role of Collaboration in Creating Protective Policies

To reiterate and elaborate, collaborative processes resolved conflicts through the planning of compromise and multi-purpose solutions that allowed incremental policy progress to be made towards greater ecological protection. Progress was incremental in the sense that the solutions recommended through collaborative processes were not especially creative or protective compared to those that would have been achieved through traditional processes alone. Instead collaborative processes provided the planning and focus on dispute resolution needed to bring the environmental policy destiny into being through small, tolerable steps rather than dramatic course correction, with the policy destiny dictated by the continued use and option of traditional processes during collaboration. Progress was also incremental in the sense that collaborative recommendations only applied to issues for which some degree of consensus could be reached.

As part of the planning and negotiation aspects of collaborative processes, recommended policies were more timely and reflective of diverse information and analysis. Some governance actors, such as the Miccosukee Tribe, believed that compromise policies developed through open processes were the best way forward, citing instances when governance acted without consensus and used forceful policies (such as use of eminent domain), thus experiencing poor outcomes ranging from delays, worsening conflict, and impressions of incompetence.

Compromise and multi-purpose policies and projects, however, also had unintended negative environmental consequences, such as overcompensating for development costs and encouraging greater development (especially in the Shark Slough case). Restoration projects also encountered technical challenges during detailed design and implementation. With CERP, collaborative processes increased support for the multi-purpose projects, for which a large component was urban water supply, thus enabling "greenwashing." Environmental groups originally proposed the integration of development interests within the C&SF Project Restudy, but they overestimated their ability to ensure environmental priorities were maintained. Collaborative process policy recommendations were subject to revision during their institution and implementation, where such revisions often reduced or delayed environmentally beneficial policy and project features, especially those that had stemmed from collaborative processes' expansion of problem boundary and solution scope in order to reach agreement and build political support. Project components favored by powerful (i.e., economic and governmental) interests had greater chance of implementation, whereas the other components were vulnerable to neglect. This trap was compounded by the fact that many projects with primarily ecological objectives were dependent upon the construction of multi-purpose projects that had great potential to serve economic development (i.e., urban and agricultural water supplies). Economic interests would have likely achieved similar gains through traditional processes, albeit probably not as swiftly and efficiently as with collaborative processes.

Toward the end of the case study time period there were a few encouraging signs of governance expanding the suite of solutions beyond infrastructure development towards responsible growth. Most notably, when faced with technical and financial limitations, as well as revised (upward) population growth estimates, the District announced its intention to institute a regional cap on Everglades water withdrawals and more aggressively pursue water conservation projects. The leadership for these initiatives came from the District's Water Resources Advisory Commission, although observers have attributed the policies to the WRAC's chair rather than the collective group. Concurrently in the mid 2000s, the state was also diversifying water solutions by promoting water conservation (demand reduction) and alternative water supply projects (such as water reclamation).

### 9.3 Capacity Building and Political Restructuring

Capacity building and political restructuring are two sides to the same coin. Capacity building is the term usually used to describe increases in power of actors (individuals, organizations, stakeholder groups, or networks) due to strengthened capabilities. Political restructuring is a term developed for this dissertation to refer to the undesirable (from an environmental perspective) or ambiguous changes in agency and interest groups' concerns, advocated positions, and strategies for influencing policy. Capacity building and political restructuring apply to environmental, governmental, and economic interests. The issue of interest in this section is how collaborative processes changed the relative power balance between environmental, governmental, and economic interests, and how this affected overall governance capacity for protecting ecological health.

9.3.1 Advantages to Environmental Interests: Access and Capacity Building

As discussed in Chapter 7, collaborative processes built intellectual and social capitals that were beneficial to environmental interests. Most collaborative processes were transparent to the public and educated diverse participants and observers about ecosystem conditions, governance activities, and group perspectives. Stakeholder groups that were not "insiders," such as the Miccosukee Tribe, residents of the 8.5 SMA, and environmentalists, valued the information presented at collaborative meetings and the chance to voice their opinions. The broader public, if so inclined, could easily access governance presentations, meeting minutes, and reports. A member of the Task Force, for instance, commented that the group's review of a CERP planning document "allowed the plan to be developed in an open and transparent manner."[4] Process transparency and the educational aspect of meetings were important for building broad governance capacity; however there were few examples of how this directly affected group behaviors and policies.

The standard of inclusion set by collaborative processes resulted in a higher demand for transparent governance, especially by those non-insider stakeholders that benefited the most. The evidence for this included numerous statements at collaborative meetings, either complaining about lack of transparency or encouraging the use of collaboration to improve transparency. Criticism of process transparency and stakeholder inclusion, for instance, was leveled at decision making concerning the 8.5 SMA, the Cape Sable seaside sparrow, CERP implementation, and the District's Long term Plan. Expectations or requirements of transparency and inclusion also provided legal and rhetorical means for groups to challenge collaborative outputs (as occurred for the 8.5 SMA, sparrow, and CERP implementation), or the outputs of processes claiming to be collaborative (e.g., the Long Term Plan).

Indeed, collaboration promoted a worldview in favor of diverse groups working together to find common ground and coordinate solutions to produce more technically sound and socially acceptable policies. The privileging of this worldview affected the types of decision making occurring (collaborative and ecosystem level), the groups favored for decision making (moderates), the kinds of preferred policies (compromise and multi-purpose), and the level of solidarity (little dissention). The impacts of the collaborative system in each of these areas were moderate, primarily because of collaboration's less dominant position within the governance system. The main contribution of collaboration to "leveling the playing field" was that it advocated the ideals of inclusion and equity.

Collaborative processes thus fostered working relationships between environmental groups and governmental and economic groups. The processes also promoted networks, which may have inspired collaboration among environmental groups, such as the Barley Group weekly conference calls. Increased networking capabilities among economic interests may have occurred, but it was unclear from the research data gathered.

### 9.3.2 Ecosystem Management Goals

Most important for the long run, collaborative processes helped establish ecological health as a publicly accepted and institutionally committed goal equal to economic development, whereas environmental values had previously held second class status. The broad support for ecological health expressed through collaborative groups, such as the South Florida Ecosystem Restoration Task Force, and the high interconnectedness of restoration projects, contributed stable, identifiable political support that kept ecological health on the governance agenda when high level political leadership, such as governors and presidents, varied in their commitment. And, the federal orientation of the Task Force, provided some resistance, along with the presence of federal interests such as Everglades National Park, to complete devolution of authority to the regional level. The loose, nonthreatening ecosystem level coordination (such as with the Task Force) had the advantage of survival during political regime changes, as well as the benefits of allowing governance to remain diverse and competitive, which is a necessary counterbalance to the dominant agencies' (District and Corps) and their tendencies towards greater ecosystem control.

9.3.3 Advantages to Governmental and Economic Interests

To the detraction of ecological protection, collaborative processes also provided powerful governmental and economic interests with advantages beyond what would have been possible using traditional processes alone. As mentioned in Section 9.2, collaborative processes enabled multi-purpose agendas that were ultimately biased towards existing and future development in the watershed, and towards greater bureaucratic and physical control of water. With the C&SF Project Restudy, collaborative processes gave the impression of greater inclusion of interests than existed at the level of plan formulation, which distracted from criticism of the economic biases introduced by the merger with the Lower East Coast Regional Water Supply Plan planning initiative and the fact that the development-oriented Corps was the lead agency. The Governor's Commission for a Sustainable South Florida acknowledged the planning bias and expressed concern for bias during implementation, but these warnings were largely ignored. More egregiously, the District inaccurately claimed in planning documents that development of the Long term Plan was conducted collaboratively. The District later admitted that it failed the public's expectation to be included in major policy initiatives.

Collaborative processes also benefited agencies by providing them with an additional forum for influencing the policy agenda and public perceptions, increasing agency legitimacy, and reducing lengthy procedural requirements. In particular, collaborative processes promoted the belief that technical solutions, provided by the dominant agencies, were possible. Government also used collaboration to avoid taking full responsibility for decisions.

Strategic advantages motivated the District and Corps to use collaboration in some circumstances. When these strategic advantages were lacking the agencies tended to avoid the processes, in spite of stakeholder expectations to the contrary. As such, the agencies developed some major Everglades policies, such as the Long term Plan/Amendment to the Everglades Forever Act, in secrecy.

Collaborative processes specifically benefited economic interests by encouraging multi-purpose projects and assurances that environmental policies would not infringe upon economic interests (or in the case of the sugar industry, that their existence would be protected). Economic interests enjoyed better public image (especially the sugar industry) and public-private partnerships, thus reducing environmental interests' ability to cast economic interests as villains and partnerships as unethical. Collaborative processes also gave economic interests greater access to policy discussions initiated by the environmental community and the educational benefits of meetings. With such benefits the economic interests found no contradiction between participation in collaborative processes and pursing their interests through a variety of forums. As a U.S. Sugar Corporation promotional brochure in 2004 stated, "The [restoration] partnership is working."[5]

Agricultural and residential development interests in the East Everglades were less powerful than the sugar and urban interests, yet they still commanded substantial attention due to their economic significance and resources (primarily agriculture), threats of lawsuits, and public campaigns (as with appeals to property and human rights). These interests were highly determined and persistent and thus did not waiver in their concerns or tactics, instead incorporating collaboration into an assortment of strategies.

### 9.3.4 Disadvantages to Environmental Interests

Collaborative processes in South Florida slightly affected environmental groups' agendas and strategies, although it is difficult to separate the impacts from the larger national movement towards moderation, cooperation, and the ecosystem approach.[6] Traditionally, since the 1970s, environmental groups across the United States have claimed their greatest victories through hard-fought legal and public campaigns focused on narrow issues. Environmental groups have been diverse, representing different levels of organization, issues, and tactics, and they have worked independently and in alliances. Since the early 1990s, the principles of collaboration and ecosystem management have become best practices for environmental governance, and many environmental groups in the United States have formed or shifted activities to reflect the new approaches.

In terms of changes in environmentalists' agenda, collaborative processes and the associated ecosystem management approach moderately distracted environmental groups with ecosystem level restoration efforts and long term capacity building activities that had uncertain payoffs. Development of CERP's Programmatic Regulations, for instance, was resource and time intensive. Ecosystem level planning (i.e., the Restudy/CERP) also gave all groups, environmental or otherwise, unrealistic expectations of future gains and thus delayed action on alternative solutions. It then became a question of how rapidly each type of interest could adapt to the realization that alternative solutions were needed. On the whole, each type of interest was adaptive. Everglades National Park, for example, maintained a narrow focus on restoration of Shark Slough and sought to achieve the most ecological benefit from the Modified Water Deliveries Project (authorized prior to

CERP). And the District and state, within only four years after CERP was approved, began proposing alternative water supply solutions, including Acceler8 and purchase of U.S. Sugar Corp. (for additional aboveground storage).

Environmental interests were somewhat disadvantaged to adaptation, because the multi-purpose solutions advocated through collaboration linked environmental gains to economic gains and assurances, thus creating disincentives to criticizing economic benefits. Bob Graham said as late as seven years after CERP's passage, "It's so important to avoid doing anything to send the signal that there's less than full commitment in the state where the Everglades is located."[7] The enhanced political feasibility of environmental projects through bundling with other values (such as water supply and flood control) and political solidarity was a powerful argument to most environmental groups, and tensions between this perspective and the traditional hard-line approach were felt within the Everglades Coalition.[8] More broadly, collaborative processes, such as the South Florida Ecosystem Restoration Task Force and Working Group, additionally inhibited criticism by discouraging extreme positions and adversarial, competitive strategies, including the use of litigation, dissention, and public criticism. And, governance rewarded moderate environmental organizations, such as the National Audubon Society and World Wildlife Fund, with invitations to participate in collaborative processes.

Collaborative processes did not, however, directly foreclose options for actors to advocate their needs through traditional processes. In fact, collaboration explicitly sought to maintain participating groups' options for alternative decision making processes, since it was in the interest of powerful groups to not let collaborative processes dominate. The

CSOP Advisory Team charter, for instance, stated, “Participation on the Team does not constitute participation in the Corps’ formal National Environmental Policy Act (NEPA) public comment process and does not preclude Team members from fully participating in the NEPA public comment process. Neither does participation on the Team modify the independent decision-making authorities and responsibilities of any agencies participating on the Team.”[9] Many participating groups thus were able to remain active in other forums.

### 9.3.5 Resistance to Cooptation

Cooptation of environmental interests was a serious concern expressed in the literature cited in Chapter 2; however this dissertation observed resistance to cooptation. The potential for cooptation during collaborative processes due to power differences between participants was tempered by the political dynamics outside of the processes to which the collaborative participants had to answer. Collaborative participants, representing environmental and economic development interests alike, had a healthy skepticism for the internal communications and potential influences of collaborative processes and remained active in other decision making arenas.

The selection of collaboration participants represented privileged decision making access and had the potential to affect participants’ public images. Collaboration favored the involvement and alliances of moderate environmental groups, but this did not significantly affect the difference in power between the moderate and hard-line groups, since collaboration represented a small component of governance, stakeholders retained their skepticism, and the more hard-lined environmental groups continued to operate.

Some groups advocating environmental protection frequently used adversarial strategies due to strong personalities and convictions, federal mandates for ecological stewardship, extra-regional influences on groups (such as national environmental group agendas and approaches), and agencies' reluctance to set precedents for less individual group autonomy. The hard-line environmental groups, such as Mary Barley's Everglades Trust and Everglades Foundation, continued to function, perhaps maintaining their identity by not participating in multi-stakeholder collaboration. A 2008 article about Mary Barley included the statement by the policy director for Audubon Florida that, "[Barley] has single-handedly shifted the balance of power in Tallahassee more in favor of the Everglades."[10] Barley continued to operate the traditional political way, through informal advocacy among her network of wealthy and well-connected acquaintances (her deceased husband George Barley was a millionaire land developer). A member of the board of directors of the Sugar Cane Growers Cooperative of Florida concurred, "About the best thing I could probably say about [Barley] is she's a worthy foe." Mary Barley, like other governance actors, leveraged the power of networks and influenced others by organizing weekly conference calls among the leading Everglades environmental groups and using the Everglades Foundation to fund other groups such as the Sierra Club and World Wildlife Fund (thus indirectly contributing to the moderate voice).[11] Perhaps less strident in 2008 than in the days of George Barley's penny-a-pound sugar tax ballot campaign of the mid-1990s, the Everglades Trust and Foundation continue to use high pressure tactics such as publicly criticizing Mike Collins (District Governing Board member and chair of the Water Resources Advisory Commission) in a billboard erected near his home in the Florida Keys.[12]

Dexter Lehtinen also resisted the call to compromise. As attorney for the U.S. Department of Justice, Lehtinen filed suit against the agency and state for failing to uphold the state's water quality standards. Following Lehtinen's resignation from the DOJ, the insular and determined Miccosukee Tribe hired Lehtinen as tribe counsel, and the tribe filed many lawsuits in support of the central Everglades until the end of the case study time period (including the 2008-09 lawsuits against the Tamiami Trail bridge and purchase of U.S. Sugar Corp.). Friends of the Everglades, the advocacy group formed by Marjory Stoneman Douglas, joined the Miccosukee in their litigation as well as filing separate legal claims (not directly related to the two case studies).

The Miccosukee Tribe, through Lehtinen, set an example for other groups to simultaneously collaborate and litigate. However, Friends of the Everglades, a group that did not participate in collaborative processes, was the only other group to file phosphorus water quality lawsuits. Affecting the Shark Slough case, there was only one instance of groups other than the Miccosukee filing lawsuits on behalf of environmental protection. Following publication of the draft CERP and ENP's charge that it was "not restoration," the Environmental Defense and National Resources Defense Council threatened to sue, thus leading to federal promises of more water for the park. Other environmental groups continued to sue over issues not addressed by the Miccosukee Tribe, such as rock mining, large-scale urban developments, and endangered species critical habitat.

This chapter concludes the presentation of the detailed findings of the impacts of collaborative processes on the three tenets of ecosystem management. The next and final chapter, Chapter 10: Conclusions and Recommendations, steps back from the details to answer the basic question of how collaborative processes affected governance's ability to conduct ecosystem management, and to offer suggestions for improvements.

### 9.4 Notes

[1] Matthew C. Godfrey, "River of Interests: Water Management in South Florida and the Everglades, 1948-2000" (U.S. Army Corps of Engineers, 2006), 402.
[2] Godfrey, "River of Interests," 167.
[3] Jon Nordheimer, "Lake's Rescue Threatens Everglades." *New York Times*, July 23, 1987.
[4] South Florida Ecosystem Restoration Task Force, "Meeting Minutes" (various dates), http://www.sfrestore.org/tf/minutes.html (accessed August 20, 2009).
[5] United States Sugar Corporation, "A Decade of Progress," http://www.ussugar.com/downloads/decade_of_progress.pdf (accessed August 17, 2009).
[6] Paul A. Sabatier, Chris Weible, and Jared Ficker, "Eras of Water Management in the United States: Implications for Collaborative Watershed Approaches." In *Swimming Upstream: Collaborative Approaches to Watershed Management*, edited by Paul A. Sabatier, Will Focht, Mark Lubell, Zev Trachtenberg, Arnold Vedlitz, and Marty Matlock (Cambridge, MA: MIT Press, 2005).
[7] Abby Goodnough, "Effort to Save Everglades Falters as Funds Drop," *The New York Times*, October 31, 2007.
[8] Michael Grunwald, *The Swamp: The Everglades, Florida, and the Politics of Paradise* (New York, NY: Simon & Schuster, 2006).
[9] CSOP Advisory Team Charter.
[10] Amy Green, "Mary Barley crusades behind the scenes for the Everglades." *Christian Science Monitor,* November 5, 2008.
[11] Ibid.
[12] Personal interview for this dissertation.

## CHAPTER 10

## CONCLUSIONS AND RECOMMENDATIONS

In late 2008 a National Research Council committee issued its second biennial review of Everglades restoration and called the Modified Water Deliveries Project to restore flow to Northeast Shark Slough, "one of the most discouraging stories."[1] The committee cited several reasons for the project's twenty-year delay in implementation, including "parochial interests, debilitating litigation,…and lack of coordinated leadership from responsible agencies."[2] When describing implementation of the Comprehensive Everglades Restoration Plan, the committee reported, "There is considerable frustration about the administrative process among managers, decision makers, and researchers in South Florida. To many of them, it appears that planning rather than doing, reporting rather than constructing, and administering rather than restoring are consuming their talents and time."[3] Most recently in mid 2009, an Associate Press journalist wrote, "Attempts to fix the Everglades by constructing water treatment marshes and reservoirs, among other things, have been dogged by politics, funding shortfalls, and contentious, litigation-filled disagreements over the best solutions. And while land has been purchased and some projects completed, key restoration components are undone."[4] A representative of the Miccosukee Tribe added, "Meeting upon meeting, and the Everglades continues to die."

These comments indict governance performance for all three tenets of ecosystem management, citing lack of integration, adaptation, and protection of ecological health. The stories are more subtle, however, especially when focusing on the protective tenet.

Much of the delay in the Modified Water Deliveries Project occurred because the initially authorized project was ecologically inadequate. Everglades National Park's campaign for a stronger plan generated conflict, and therefore gridlock, and required substantially more technical planning, negotiation, and political capacity building. The Miccosukee Tribe's numerous lawsuits, while considered debilitating by some groups, such as the South Florida Water Management District, have rightfully pushed agencies to satisfy the protective requirements of phosphorus legislation beyond comfortable technical, financial, and political limits. And, one would expect implementation of a comprehensive restoration plan consisting of scores of interrelated projects to require extensive planning, reporting, and administering, and it is not surprising that, with limited governance abilities and resources, such an effort would be exhausting. Nor is it entirely unexpected that the plan would go the way of other large-scale "multi-purpose" revisions of the Central and Southern Florida Project and favor economic interests, but to a lesser degree than in the past.

The Everglades situation illustrates the challenges of achieving ecosystem management. What was to blame for the inadequate ecosystem management? Lawsuits? Overzealous bureaucracy? Or even, "meeting upon meeting," i.e., collaborative processes? Or, were the results the best governance could do with the decision making and institutional tools, knowledge, and political will at its disposal? If that was the case, what were the successful decision making processes, and how should they be continued and improved? And what threats and barriers to ecosystem management should be removed?

### 10.1 Review of Dissertation Question and Approach

This dissertation considered whether and how *collaborative decision making and implementation processes* advanced the ecosystem management approach for the Everglades. Many theorists consider collaborative processes to be exceptionally suited to support each of the three tenets of ecosystem management, and indeed many regional environmental initiatives include such processes. Everglades governance, for instance, used scores of collaborative processes at various scales over three decades. Yet other theorists are concerned about the potential for reinforcing domination by powerful economic and governmental groups. Clearly, much reflection and research should be done to chart a course for continuous improvement of ecosystem management, and to evolve collaborative planning and ecosystem management theories.

The dissertation research took a holistic view of collaborative processes impacts, examining for the Everglades cases the full range of impacts predicted in the literature and considering how the processes interacted with traditional processes as issues moved through the policy cycle. The literature review identified potential impacts in the areas of problem solving, capacity building, and political restructuring. The types of impacts reflected the major themes in the realm of planning theory, especially how governance should make "rational" and efficient decisions, and attend to diverse and disadvantaged interests, in the context of pluralist politics and institutional constraints. Beyond these major planning theory themes, collaborative planning theory added attention to governance needs for conflict resolution and building political, social, intellectual, and organizational capital. The additional, normative concept of ecosystem management provided an evaluation framework for collaboration when concerned with environmental impacts, especially on ecological health. Chapter 2 presented the theories of collaborative processes as they related to the three tenets of ecosystem management (integrative, adaptive, and protective governance), noting gaps in understanding.

This Everglades study confirmed most of the claims in the collaboration literature, even those that were seemingly at odds. A major difference was that the impacts, positive and negative, in the Everglades were not as pronounced as described in the literature. The reasons for the relatively modest impacts were that collaborative processes represented a small portion of governance decision making and multiple kinds of impacts led to complex interactions that tempered outcomes. The second major difference from the literature was that the dissertation's perspective resulted from a holistic research approach that noted impact magnitudes and net effects. The dissertation observed that collaborative processes served an intentionally strong conflict resolution role, with the problem solving role in a subordinate, but still important, position, contrary to the emphasis in the pro-collaboration literature. The next section provides a synthesis of the findings from in Chapters 7 to 9 and reports the significance for theory and practice.

## 10.2 Conclusions

### 10.2.1 Collaboration as a Political and Bureaucratic Hybrid

Understanding the role of collaborative processes in advancing (or limiting) ecosystem management is the ultimate objective of this dissertation. The term "role" is meant to suggest relationships between collaborative processes and their governance context, i.e., traditional decision making processes. Identifying how collaborative processes compare to and interact with traditional processes provides the key to understanding impacts on ecosystem management.

The empirical evidence suggested that collaborative processes were a hybrid of political and bureaucratic processes. On a continuum from interactive political bargaining to administrative instrumental rationality as shown in Figure 5, communicative rationality bridges these two extremes. To elaborate, political bargaining is built upon claims to subjective valuation and assessment by political actors in competition, while administrative rationality is built upon claims to value neutrality, objective analysis, and a unitary public interest. Communicative rationality incorporates both subjectivity *and* analysis of interest group discourse, which provides opportunities for agreement. Figure 5 indicates the different types of decision making processes approximating these philosophies, including the placement of traditional public participation processes, i.e., consultation. Within the sphere of collaborative processes, individual collaborative processes can occupy various points along the continuum.

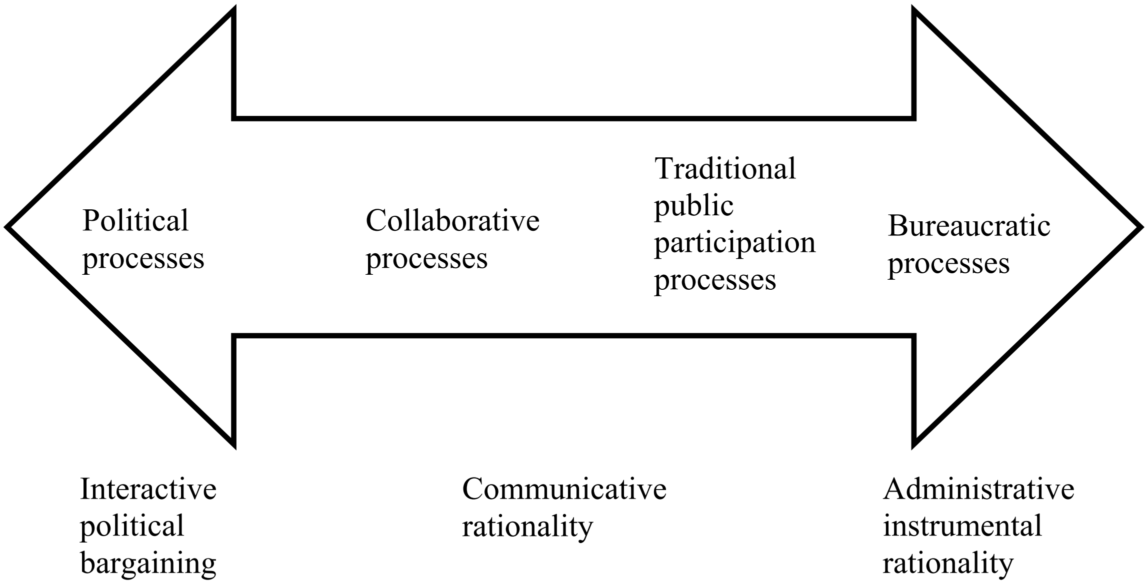


Figure 5 Process and Philosophical Continuum

In a similar fashion, Innes and Gruber identified four planning styles in a case study of regional transportation planning in the San Francisco Bay area: technical/bureaucratic, political influence, social movement, and collaborative planning.[5] The technical/bureaucratic style was the rational comprehensive model of planning. The political influence and social movement styles of planning were political processes. Political influence planning involved government doling out resources to various interests, thus resulting in a "remarkable degree of unanimity among the transportation providers in the region for many years as all supported agreements that contained something for almost everyone. This united front was clearly helpful in maximizing funding and getting legislation passed."[6] Social movement planning occurred outside formal government and involved strategic actions by interest groups, especially those that were disadvantaged, such as media campaigns and litigation (thus connecting with judicial processes). The authors placed the planning styles along two continuums, degree of diversity representation and recognition of interdependencies (and therefore benefits of cooperation). They identified collaborative planning as high on both counts.

While Innes emphasized the distinctions of the collaborative planning style, which are especially relevant to the integrative tenet, this dissertation's conclusions also stress the similarities with the political and bureaucratic processes as illustrated by the continuum in Figure 5. In the Everglades cases, the shared characteristics and interactions between process types were significant. Innes and Gruber found "conflicts" among planning styles, whereas this dissertation also observed synergies (both positive and negative for ecosystem management), such as in regards to why governance leaders convened and participated in collaborative processes. As discussed by Innes and Gruber, collaborative processes are most distinct by virtue of diverse representation *and* consensus building. In practice, many Everglades collaborative processes met these requirements to some extent but fell short of the ideal. Innes and Gruber identified few processes in the regional transportation planning case that they would classify as collaborative planning, whereas this dissertation's definition of collaboration was more lenient.

### 10.2.2 Hybrid Model Implications for Ecosystem Management

This dissertation found that collaborative processes improved each of the three tenets of ecosystem management compared to what would have likely been achieved through traditional processes alone. Governance performance needed substantial improvement, however, since even modest ecological gains were taking decades to achieve. Meanwhile ecosystem threats, such as urban population growth, continued to intensify.

Collaborative processes improved the three ecosystem management tenets in the Everglades, because the processes were flexible and simultaneously attended to values and analysis, either directly or through linkages with other political, bureaucratic, and judicial processes. Collaborative processes were most importantly an extension of bureaucratic institutions, such as the District and Corps, and other administrative leadership, such as the Florida governors. The analytic tendency of the bureaucracy led to efforts to rationalize decision making according to ecosystem characteristics and sustainability (including ecological health) in order to improve agency competence. The South Florida watershed was rapidly changing, and there were conflicting uses of the natural environment and highly interconnected interests, and these interests depended upon the dominant agencies that controlled the extensive water management infrastructure. Systemic rationalization required the tenets of integration and adaptation, for which bureaucratic processes and institutions are not known to excel.

The fact that the South Florida Water Management District's boundaries corresponded to the South Florida watershed was already a big step towards merging values with analysis. Collaborative processes allowed this merger to go further. A strong, yet open minded and moderately transparent, centralized water management agency was a tremendous source of power for environmental interests compared to the fragmented authority typically found in other watersheds (outside Florida). Collaborative processes, operating within a governance system of diverse and strong interest groups, provided a means of encouraging this style of centralized management. Fortunately, environmental groups maintained much of their tenacity and focus despite the cooperative influence of collaborative processes.

Perhaps more essential, in order for the bureaucracy to function, collaborative processes enabled conflict resolution and policy support. The political aspects of collaborative processes often resulted in recommendations of compromise solutions and multi-purpose projects, and therefore enhanced political support, similar to what is achieved through the political influence style of planning described by Innes and Gruber. Collaborative processes' combination of values representation and analysis furthermore gave the processes high legitimacy among governance actors and the public. Collaborative processes' institutional flexibility permitted their rapid and tailor-made construction to specific issues, while their ability to reach consensus on many points allowed speedier policy making and implementation.

In a tethered race, environmental, governmental, and economic interests made faster, incremental progress toward their goals in the short run and negotiated a range of terms that each group found satisfactory based upon their hopes to have the upper hand in the future. Given that governance has historically sacrificed environmental values when in direct competition with economic, governmental, and other development values, it would appear that environmental interests are less likely to gain the upper hand. The saving grace for environmental interests, however, is that at a broad scale they are truly interdependent with economic and other social values. Collaborative processes' capacity building to acknowledge, codify, and proactively plan for this fact, and sustain the commitment, is critical for progress towards ecological health and ecosystem sustainability.

10.2.3 Collaboration Traps and Areas Needing Improvement

While collaborative processes accomplished much and avoided some of the most serious potential negative impacts (such as pacification of environmental groups), collaborative processes in the Everglades fell short of theoretical ideals, thus leading to less stellar results for ecosystem management. In theory, collaborative processes are extremely relevant to achieving the three tenets of ecosystem management. In practice, however, there are real-world distortions and challenges. Shortfalls occurred because of a combination of reasons: insufficient use of collaborative best practices, contextual barriers, and collaborative process traps. Insufficient use of best practices and contextual barriers, while not directly reflective of collaboration's potential, suggest real-world limitations and considerations, especially those created by group power dynamics and institutional legacies. The collaborative process traps pertain to the ultimate appropriateness and tendencies of collaboration.

Insufficient use of collaborative best practices mainly involved the degrees of stakeholder representation and deliberation. For a variety of reasons related to group power, incentives, resources, and institutional requirements, full engagement in collaborative processes occurred primarily among a few groups for any particular issue. Similarly, deliberation varied, thus resulting in some groups thoroughly exploring the issues, while others quickly deflected them away from consideration. In some instances, collaboration was transformative; in others it was mildly informative or frustrating. This variation reflected the fact that collaborative processes emerged when powerful actors deemed them useful. Attention to best practices was necessary in order to maintain process legitimacy and some effectiveness, yet there were strong pragmatic (i.e., political) forces at work. The findings, however, represented a best-case scenario, because Everglades governance leaders were aware of collaborative best practices, and collaboration experts were available (e.g., the Florida Conflict Resolution Consortium and renowned facilitators).

The main contextual barrier limiting the success of collaborative processes was the challenge of implementation. Following collaborative planning, governance largely reverted to traditional processes during periods of implementation. Since collaborative processes did not significantly change power relations, collaborative outputs and the political capital upon which they depended were largely transient. Collaboration produced a delicate balancing act of aligned interests in keeping with the rhetoric of win-win and sustainability. Collaborative recommendations appeared highly integrated, yet under the surface there were strategic motivations and shallow commitments. The agreements began to unravel when system dynamics or technical shortcomings changed the conditions upon which the agreements depended. Combine this with the long-range dominance of economic interests, and the result was poorer implementation performance for environmental plan features.

Last, collaborative process traps are defined as shortcomings that result from seemingly proper functioning of the processes. The traps are irrational and limiting sacrifices in order to achieve the benefits of collaborative processes, such as keeping collaborative processes moving forward and reaching agreement. The interrelated traps observed in the Everglades cases included incrementalism and avoidance, overly optimistic expectations for recommendations, and naïve assumptions about collaborative processes.

The first trap, incrementalism and avoidance, refers to the fact that collaborative processes were less about communicative rationality and more about resolving conflict, achieving political support, and delaying the resolution of seemingly intractable issues whenever possible. As a result, collaborative knowledge contained gaps, and recommendations were not especially creative or oriented towards long-term ecological sustainability. Ecosystem level collaborative processes often failed their missions of providing leadership for ecological health. Incrementalism and avoidance, while often considered the only way forward, is insufficient adaptation given rapid ecological decline and rising threats.

The second trap was collaborative processes' overly optimistic expectations for recommendations. Collaborative process recommendations put much faith in governance ability to find technical solutions to meet multiple objectives, and to effectively implement them, thus requiring a host of long-term capacities such as funding, institutional stability, and commitment to original goals. These somewhat irrational beliefs, however, allowed agreement and therefore incremental progress. The beliefs in technical and administrative prowess were desirable from the perspective of the water management agencies (District and Corps), because they reinforced their missions and control. The beliefs thus maintained the philosophy of technocratic planning by a few dominant agencies. The beliefs also resulted in collaborative recommendations that were vulnerable to capture by economic interests. Collaborative processes recommendations at times recognized the potential for policy institution and project implementation to fall short of meeting objectives, and the result was inclusion of adaptive governance during implementation. The adaptive approach, however, was underdeveloped and therefore often ignored.

The third trap, naïve assumptions about collaborative processes and their outcomes, addresses contextual phenomena. As this dissertation showed, collaborative processes were subject to biases and distortions due to strategic behaviors of groups and therefore fell short of their communicative rationality ideals. Contrary to common belief, consensus was not directly based on restoration of ecological health. Instead, consensus relied on delicately balanced social-political relationships and interconnected projects. The unified political front was thus more fragile than many governance leaders thought. And, collaborative processes gave an air of inclusion and transparency, while many important decisions were made behind closed doors. The high legitimacy, rhetoric, and novelty of collaborative processes, however, masked these biases and limitations. Added to the veneer were the philosophies of ecosystem management and adaptive management that suggested holistic and responsive governance. These naïve assumptions led to inaccurate assumptions about the capabilities and accomplishments of collaborative processes, thus leading to surprises and reducing critical examination of governance by external groups.

### 10.2.4 Towards an Ecology of Governance

This chapter's introductory passage suggested governance failure to protect the ecological health of the Everglades. With the perception of failure came blame pointing to the lack of consensus on solutions, extensive litigation, excessive bureaucracy, the reliance on collaborative meetings, scientific uncertainty, factors beyond local control (such as loss of federal funding), and many other potential reasons. What really *was* to blame for inadequate ecosystem management? The enormity of the task.

In all of governance and society, the task of protecting ecological health has been drastically underestimated. Ecological health will require substantial curbing of development and investment in restoration to undo past decisions. These changes necessitate making ecological protection a high priority, and the will to change must come from within society and under conditions of uncertainty. Towards these ends, each type of decision making process and institution has an important role to play within an integrated framework, or ecology of governance. Political processes allow the struggle of values in order to overcome the status quo. Bureaucratic processes provide the capacity for policy institution and system monitoring. Judicial processes hold society accountable to past decisions and core values. Collaborative processes bridge the political, bureaucratic, and judicial processes, facilitating governance integration and adaptation to mitigate the traps of the traditional processes, such as gridlock and dysfunctional relationships, but they do not eliminate group identities and power dynamics. Communicative rationality and collaborative best practices are guides for achieving successful processes. To expect collaborative processes to do more than they are designed and capable of doing is fallacy. The goal for ecosystem management theorists and practitioners is to design a more effective governance ecology given understandings of the strengths and weaknesses of each type of process, how they interact with each other, and the constraints of a particular social-ecological setting.

## 10.3 Recommendations for Practice

Theory and empirical evidence are ultimately intended to inform practice in order to meet societal goals. This dissertation normatively evaluated the use of collaborative processes for ecosystem management, and therefore the recommendations presented here have that objective as well. Specifically, the recommendations are designed to improve governance performance of the three tenets: integration, adaptation, and ecological protection. And, since the dissertation found that collaborative processes were beneficial but limited, the recommendation focus on improving the role of collaboration through changes in collaborative process usage and execution, as well as contextual conditions to enable success. The Innes and Gruber paper, for example, focused on reducing barriers to collaboration. This dissertation's recommendations take advantage of collaborative processes strengths for furthering integrative, adaptive, and protective governance, while reducing the traps and areas needing improvement. The recommendations below are directed at the governance of the Everglades, however they offer insights for other environmental initiatives as well. Each recommendation elaborates the barriers involved and possible steps to overcome the barriers. The evolution of collaboration and ecosystem management should be an ongoing process achieved through deliberation, experimentation, and reflection. These recommendations are thus one small, initial step.

- **Continue to use high-quality ad hoc collaboration for complex, high-stakes problems.** High-quality ad hoc collaborative processes had many benefits, thus existing processes should be improved and new processes applied more liberally to complex, high-stakes problems. High quality processes generally means those with broad stakeholder representation and a focus on problem solving and consensus building. Barriers to this recommendation are lack of leadership to create new processes and strengthen existing ones, and procedural conflicts with litigation and standard bureaucratic processes. The achievement of high-quality processes is dependent upon performance of the larger governance system, as discussed below under "support diverse, networked, and resourceful civic engagement."[7]

- **Continue ecosystem level coordination groups.** The ecosystem level coordination groups were an important source of stable ecosystem identity and institutional infrastructure, but their operation was weak and needs improvement. Improvements could come from ecosystem level groups responding to the recommendation for more and better ad hoc collaborative processes, and through higher standards for coordination. Several ecosystem level groups made this recommendation during self-evaluation exercises, but to limited success, therefore constant attention to this issue will be required. Barriers to this recommendation include coordination groups' reliance on external political support and internal deference to the most powerful members. A means of overcoming these barriers would be through greater ecosystem restoration and governance oversight as described below.
- **Re-integrate technical, interagency, and stakeholder collaborative processes.** The concepts of ecosystem management and adaptive governance recommend the integration of environmental, social, economic, and institutional aspects of problems. Yet collaborative processes in the Everglades were increasingly divided along these lines. Greater integration could occur through more comprehensive

processes or better coordination between processes. Barriers to this recommendation are a lack of political will for integration, methods to accomplish integration, and the vulnerability of scientists and staff to political backlash.

- **Directly support diverse, networked, and resourceful civic engagement.** The first line of support for high quality collaborative processes is strong civic engagement that is diverse, networked, and resourceful. Such a society would provide greater equality among the various interests and actors. Towards this end, governance leaders should support decision making transparency and the ability of groups to meaningfully access traditional processes. Likewise, collaboration should temper its rhetoric for cooperation with the merits of adversarial approaches. Barriers to this recommendation include a lack of understanding about how to balance cooperation with competition. This recommendation is suggestive of Flyvbjerg's observation, "The normative emphasis on rationality leaves the modern project ignorant of how power works and therefore open to being dominated by power," and "that forms of participation that are practical, committed, and ready for conflict provide a superior paradigm of democratic virtue than forms of participation that are discursive, detached, and consensus-dependent, that is, rational."[8]
- **Continue independent oversight of collaborative processes, governance, and restoration.** Oversight provided by the National Academy of Science was intended to focus on the CERP progress; however the panel has fortunately provided opinions about other South Florida restoration efforts, including those of interest in this dissertation. Holistic and comprehensive evaluation of the

ecosystem should continue. Beyond an ecosystem report card, oversight should include evaluation of governance, including collaborative processes. This has occurred to some extent with the NAS panel and Congressional oversight of the Task Force, and this effort needs to be doubled. Oversight of governance would improve awareness of the types and quality of decision making processes, and the limitations and pitfalls of collaboration and ecosystem management/restoration. In particular, oversight should temper the belief in collaboration's ability to reach consensus and the Corps' ability to design solutions to meet consensus requirements. Barriers to this recommendation are the political leadership and resources needed to sustain high-quality oversight and follow-through.

- **Encourage double- and triple-loop learning for protection of ecological health.** The paradigm of adaptive governance is fundamentally different from "adaptive management" and "incremental adaptive restoration."[9] The latter approaches strive to facilitate adaptive governance, yet they are only add-ons to the scientific approach. As such, governance should first explore what adaptive governance is, imagine what it might look like for South Florida, and examine opportunities and barriers to adopting this paradigm. Double- and triple-loop learning for protection of ecological health should be the emphasis. This effort would integrate with the recommendations above and include changes to the relationship between the traditional and collaborative processes. The new relationship would untether collaboration from its incorrect assumptions regarding consensus and engineering responsiveness, and allow it to be more creative, take more chances, and provide societal resilience when actions are not successful.

Barriers to this recommendation are unwillingness to let go of the technocratic approach and the degree of change needed to adopt the new paradigm.

## 10.4 Recommendations for Future Research

This dissertation, like any research study, is a link in the knowledge chain, building on past understanding and suggesting new areas for investigation. The dissertation's most significant contributions to the literature are that it presented a method to holistically evaluate collaboration within a governance context and over sufficient time to observe environmental outcomes, and thereby integrated and reconciled multiple and seemingly contradictory understandings of collaboration. The dissertation provided a "magnitude of order" interpretation of the impacts of collaboration, thus tempering many of the theoretical claims (positive and negative). The dissertation judged that the environmental outcomes of collaboration were beneficial on balance. The findings combined with the fact that this dissertation was one of only a few to attempt this holistic approach, and the only one to fully do so, suggest fruitful next research steps.

First, the fact that the research examined a single governance context (South Florida) limits the ability to generalize the findings. Future research should holistically evaluate collaborative governance in other settings in a comparative fashion. Study replication in other settings can test this dissertation's theoretical contribution, and comparison between cases can lead to other questions of interest such as why there are differences. The concern with governance paradigms can provide additional guidance on case selection. Gunderson and Light cite management of the Grand Canyon river system in northern Arizona, a section of the Colorado River, as an example of adaptive governance in a context having similar "resource demands and uses, institutional complexity, and asymmetries of power among stakeholders."[10] A study could ask, What role did collaborative processes play in making the Everglades and Grand Canyon governance systems different? A recent case study of governance of the Colorado River, however, was critical of its adaptive performance and recommended the formation of watershed/ecosystem level coordination.[11] Expounding on the Everglades case would illuminate the potential and limitations of this approach.

Second, since this dissertation's holistic evaluation painted with a broad brush, future research could hone in on several of the most interesting findings in this dissertation in order to understanding them more fully. The most initially productive research would focus on more specific testing of this chapter's recommendations. Such research could, for example, offer a better understanding of (1) the reliance of collaboration on the incorrect assumptions (of consensus and technical capabilities), (2) the barriers to frequent, high quality collaboration and its influence, (3) the relationships between process design and outcomes, and (4) the interactions between the formal governance systems (including collaboration) and the informal governance networks.

Last, the dissertation evaluated the ability of collaborative governance to reduce two threats of interest, the Everglades Agricultural Area phosphorus and Shark Slough flow regime threats. An even more holistic evaluation of collaborative governance would look at all of its environmental gains across an ecosystem and not just a few of the threats. Everglades collaboration achieved many other successes and posed additional challenges, and an analysis of these other successes and challenges, including what they had in common and how collaboration filled a unique role in addressing these issues, would ensure that recommendations for collaboration retain these advantages as well.

## 10.5 Notes

[1] National Research Council, Committee on Independent Scientific Review of Everglades Restoration Progress, *Progress Toward Restoring the Everglades: The Second Biennial Review* (Washington, DC: National Academies Press, 2008).

[2] Ibid.

[3] Ibid, 229.

[4] Brian Skoloff, "Florida Bay's Ecology on the Brink of Collapse," http://news.yahoo.com/s/ap/20090805/ap_on_re_us/us_dying_florida_bay (accessed on August 20, 2009).

[5] Judith E. Innes and Judith Gruber, "Planning Styles in Conflict at the San Francisco Bay Area's Metropolitan Transportation Commission" (Berkeley, CA, University of California at Berkeley, Institute of Urban and Regional Development, 2001).

[6] Ibid, 22.

[7] Judith E. Innes, and David E. Booher, "Consensus Building and Complex Adaptive Systems: A Framework for Evaluating Collaborative Planning." *Journal of the American Planning Association*. 65, no. 4 (1999): 412-423.

[8] Bent Flyvbjerg, *Rationality and Power: Democracy in Practice*. Translated by Steven Sampson (Chicago, IL: University of Chicago Press, 1998).

[9] "Incremental Adaptive Restoration Proposal for the Southern Everglades Restoration Projects," Preliminary Draft Version 1.10. February 1, 2008.

[10] Lance Gunderson and Stephen S. Light, "Adaptive Management and Adaptive Governance in the Everglades Ecosystem." *Policy Sci* 39 (2006): 323-334.

[11] Robert W. Adler, *Restoring Colorado River Ecosystems: A Troubled Sense of Immensity* (Washington, DC: Island Press, 2007).

# APPENDIX A

# PHOSPHORUS CASE COLLABORATIVE PROCESSES

### A.1 Special Project to Prevent the Eutrophication of Lake Okeechobee (1973-76)

The Florida Legislature created, and the Division of State Planning sponsored, the Special Project to conduct and integrate research concerning the ecological impacts of nutrients on the Lake Okeechobee. Participants were an interdisciplinary team of federal, state, and local agencies, universities, and consulting firms. The Special Project's Interim Report was not published because it was critical of past drainage policies. The Special Project issued a final report that identified the main source of nutrients to the north of the lake and recommended discontinuing backpumping to the lake from the Everglades Agricultural Area to the south.

### A.2 First Lake Okeechobee Technical Advisory Council (LOTAC I) (1985-86)

Governor Bob Graham directed the Florida Department of Environmental Regulation (DER) to study Lake Okeechobee eutrophication. DER formed the first Lake Okeechobee Technical Advisory Council (LOTAC I) composed of scientists and representatives of agriculture, environmental groups, and local, state, and federal agencies. LOTAC I recommended diverting nutrient-laden water from the lake, with possible use of the Holey Land to store and treat the diverted water.

### A.3 District Response to Algae Bloom and LOTAC I (1986-88)

At the time the first Lake Okeechobee Technical Advisory Council (LOTAC I) report was released, Lake Okeechobee experienced a large algae bloom, and public criticism was directed at the District and LOTAC I. The South Florida Water Management District created cross-departmental teams to develop integrated solutions to the lake's problems. The District held three workshops with environmental groups, agricultural interests, and other agencies. In addition, the District created the Lake Okeechobee Stakeholders Advisory Committee to assist development of the Protection Options Summary that was forwarded to the Florida Legislature. The District, with input from the advisory committee and the second Lake Okeechobee Technical Advisory Council (see A.4), finalized its Action Plan to Protect Lake Okeechobee and the Everglades.

**A.4 Second Lake Okeechobee Technical Advisory Council (LOTAC II) (1987-90)**

The Florida Surface Water Improvement and Management (SWIM) Act created the second Lake Okeechobee Technical Advisory Council (LOTAC II) to investigate and make recommendations concerning the ecological effects of the first Lake Okeechobee Technical Advisory Council's proposed flow diversions and the previous action to eliminate backpumping from the Everglades Agricultural Area (under the District's Interim Action Plan). Members were scientists, including representatives of environmental groups and the Florida phosphate council (phosphate miners and fertilizer manufacturers). LOTAC II's interim report warned that nutrient impacts could spread across the Everglades and that they may be constrained by law. LOTAC II recommended constructing wetlands to reduce phosphorus entering the Everglades (i.e., Stormwater Treatment Areas), agricultural best management practices, and comprehensive water quality planning (presumably a SWIM plan). The recommendations led to the state's authorization of the Everglades Nutrient Removal Project, a pilot project Stormwater

Treatment Area. LOTAC II also provided technical review of the first draft of the Everglades SWIM Plan.

### A.5 Advisory Committee to Prioritize SWIM Planning (1987-88)

The South Florida Water Management District formed a committee composed of state agencies and local governments to prioritize water bodies to receive SWIM plans (under the Surface Water Improvement and Management Act). The committee selected the Everglades as a priority body, even though the SWIM Act did not require it. The District then began collecting and analyzing agency data for the Everglades SWIM Plan.

### A.6 Everglades SWIM Plan Advisory Committee (1989)

The South Florida Water Management District created the committee with members from state agencies and agricultural interests (including the sugar industry) for the purpose of identifying issues and management options. The committee considered Stormwater Treatment Areas, agricultural best management practices, and permit programs. The committee also discussed issues of Everglades hydroperiod, as a result of the sugar industry calling attention to the ecological impacts of flow disruption and possible reduction of flow due to the STAs. The committee, along with the second Lake Okeechobee Technical Advisory Council (see A.4), provided input to the first draft of the Everglades SWIM Plan that recommended Stormwater Treatment Areas and a final phosphorus concentration of 30 ppb, but without deadlines or requirements from the sugar industry.

### A.7 Negotiations for Joint Federal Comments on Everglades SWIM Plan (1990)

During the federal lawsuit, the Department of Justice led negotiations to unify the federal agencies' response to the first draft Everglades SWIM Plan. Additionally, an interagency team of federal scientists drafted joint comments and commissioned scientific studies.

### A.8 Martinez Meeting to Settle Federal Phosphorus Lawsuit (1990)

Governor Bob Martinez held a multi-stakeholder meeting to advance a preliminary proposal to settle the federal phosphorus lawsuit. Several governance leaders representing the sugar industry, environmental interests, and the South Florida Water Management District had endorsed the proposal, but it did not gain traction because several key parties had not been involved in its development.

### A.9 Powers Negotiations to Produce Settlement Agreement (1991)

Governor Lawton Chiles brought state and South Florida Water Management District officials, environmental groups, and the sugar industry together to reach agreement, but the initial meeting ended abruptly. Nor could scientists reach agreement on size of the Stormwater Treatment Areas (STAs). The District then brought in Timer Powers, a former member of the District's Governing Board who had facilitated other District mediations. Timer Powers asked the Florida Conflict Resolution Consortium to help facilitate interagency technical agreement and design a process for political settlement. The negotiations produced the Settlement Agreement that settled the federal lawsuit. The Settlement Agreement included requirements for STAs, agricultural best management practices, and phosphorus standards (with deadlines). The federal court maintained oversight. The agreement did not specify funding sources.

### A.10 Technical Oversight Committee (TOC) (1991-present)

The Settlement Agreement (see A.9) established the Technical Oversight Committee (TOC) to coordinate research, monitoring, and compliance, and to make recommendations to the settlement principals. Members were technical representatives of the federal agencies (Everglades National Park, Loxahatchee National Wildlife Refuge, and the U.S. Army Corps of Engineering) and state/regional agencies (Florida Department of Environmental Regulation and the South Florida Water Management District). The Everglades Forever Act continued operation of the TOC. The TOC met quarterly, or more often as needed, with meetings routinely attended by other interests. The Settlement Agreement also directed the TOC to reach consensus, but on controversial issues, members voted, with federal and state representatives often disagreeing. The Settlement Agreement envisioned the TOC playing a larger role in overseeing research for the state's numeric phosphorus criterion than it ultimately did.

### A.11 Stormwater Treatment Area Design Working Group (1991-92)

The District convened a diverse group of technical experts representing state/regional and federal agencies, agricultural interests, and other stakeholders to assist development of a conceptual design for the Stormwater Treatment Areas.

### A.12 Scientific Advisory Group for the Everglades (SAGE) (1992-93)

Similar to the Stormwater Treatment Area Design Working Group (see A.11) a year prior, the Everglades SWIM Plan established the Scientific Advisory Group for the Everglades (SAGE) for the purpose of assisting the South Florida Water Management District's Governing Board in selecting phosphorus reduction technologies, of which Stormwater Treatment Areas (STAs) was one. SAGE consisted of state and federal agencies and a broad base of stakeholders, including sugar and vegetable growers, urban communities, tribes, and environmental organizations. Due to advocacy by the sugar industry, SAGE spent considerable time assessing the alternatives in relation to STAs. SAGE ultimately determined that STAs was the most viable technology and recommended pilot testing of chemical treatment. SAGE stopped meeting when the Cormick mediation (see A.13) became the main avenue for technical negotiation.

### A.13 Cormick Mediation to Produce the Technical Plan (1992-94)

In response to the many lawsuits filed by the sugar industry against the Settlement Agreement and Everglades SWIM Plan, the South Florida Water Management District, state, and Department of Justice proposed negotiations and recruited nationally renowned mediator Gerald Cormick. Cormick organized a broad-based policy mediation group and a Technical Mediation Group of scientists chosen by the policy group. The Technical Plan was completed and became an attachment to the Statement of Principles (see A.14) and eventually the Everglades Forever Act. As a result of the sugar industry's advocacy, the Technical Plan expanded the phosphorus reduction efforts to other (not the Everglades Agricultural Area) inflows to the Everglades and included features to restore flow regime along the northern border of the Water Conservation Areas. Issues of funding and land acquisition remained unanswered.

### A.14 Babbitt Negotiations to Produce the Statement of Principles (1993)

The U.S. Secretary of the Interior, Bruce Babbitt, wanted to resolve the phosphorus conflict in order to clear the way for the Central and Southern Florida Project Restudy. With the state's blessing, Secretary Babbitt negotiated with sugar industry representatives concerning restoration funding. The negotiation resulted in the Statement of Principles signed by the federal and state/regional agencies, and the sugar industry. With the Statement of Principles, the sugar industry would pay about a third of phosphorus reduction costs over twenty years. The Cormick mediation (see A.13) continued but reached an impasse. The sugar industry convinced Secretary Babbitt to allow the issues to be settled through state legislative action. The result was the Everglades Forever Act.

### A.15 Workshops for the State's Phosphorus Criterion (2001)

The Florida Department of Environmental Protection (DEP) held a series of multi-stakeholder workshops moderated by the Consensus Building Institute. The purpose of the workshops was to "take a fresh look at the science" during the agency's development of the numerical phosphorus standard and procedures for monitoring compliance. The workshops included agricultural, environmental, tribal, and other interests. Following the workshops, DEP recommended a phosphorus criterion of 10 ppb, whereas two years earlier DEP scientists had advocated 8.5 ppb. DEP also kept the option open for a phosphorus rule based on use of phosphorus-reduction technology (rather than a numeric standard).

### A.16 WRAC Issue Workshops for Long term Plan Revisions (2003-04)

The Water Resources Advisory Commission (WRAC) held several "issue workshops" to provide input on revisions to the South Florida Water Management District's Long term Plan for Water Quality. The plan revisions were not substantial or controversial. The WRAC was not involved in development of the original Long term Plan.

# APPENDIX B

## SHARK SLOUGH CASE COLLABORATIVE PROCESSES

**B.1 Interagency Planning of the Survey-Review Plan (1965-68)**

Everglades National Park (ENP) asked the U.S. Army Corps of Engineers to prepare a Survey-Review Report to improve water deliveries to the park. The Corps agreed and communicated with ENP and the South Florida Water Management District during the planning process. The Corps agreed to an interim water delivery plan for ENP until structural improvements (such as more canals, levees, and pumps in the Water Conservation Areas and park) would be in place to meet a minimum delivery schedule. As part of the process, the Corps recommended changes to the Central and Southern Florida Project to meet future water needs of the growing urban population. This resulted in increased water storage in Lake Okeechobee and the WCAs, and authorization of the ENP-South Dade Conveyance System. ENP requested that water drained by the South Dade system be redirected to Taylor Slough, but this was not done.

**B.2 East Everglades Resources Planning Project (1978-80)**

The U.S. Environmental Protection Agency and the U.S. Department of the Interior established a program to fund planning in sensitive areas adjacent to national parks. Under this program, Dade County formed the East Everglades Resources Planning Project to examine resource management issues in the area and make recommendations. An interagency steering committee guided the project with emphasis on technical analysis, and two citizens advisory committees represented East Everglades property owners and farmers, and environmental groups. The effort was most concerned with the East Everglades for its aquifer recharge value, and the report recommended seasonal agriculture and no further residential development (except ancillary to agriculture), with public acquisition a last resort. Dade County adopted the plan and passed ordinances for its implementation.

### B.3 Committee to Study Jetport in WCA 3B (1982-83)

When concerns were raised regarding citing an airport (or jetport) in Water Conservation Area 3B, Governor Bob Graham formed a committee to analyze South Florida's future aviation needs. Environmental groups were not strongly opposed to the site, since they believed it would be less detrimental than other sites considered. The committee was composed of representatives from state agencies and private industry, and a university expert. The committee found that the existing airport could meet the region's demands through 2000 and that further consideration of the site in WCA 3B was unwarranted. The governor opposed the jetport plan and did not renew the state's participation in the Everglades Jetport Pact.

### B.4 Interagency Agreements for the Experimental Program (1983-99)

Everglades National Park advocated its Seven-Point Proposal for improving the park's water flow regimes. The South Florida Water Management District, U.S. Army Corps of Engineers, and ENP developed the proposal into the Experimental Program of Water Deliveries. The Experimental Program was operational changes designed to increase flows to Northeast Shark Slough and provide information for additional structural and operational changes through the Modified Water Deliveries Project. When the U.S. Congress approved the Experimental Program, it required the National Park Service, Corps, and District to agree on the terms of the experiments.

**B.5 East Everglades Mediation (1983-85)**

East Everglades farmers and homeowners sued the South Florida Water Management District and U.S. Army Corps of Engineers to stop the Experimental Program, and the dispute was mediated. The negotiated agreement allowed the program to go forward provided there were operational measures (such as pumping in canals) to mitigate the risk of flooding in developed areas due to the program. Studies later found that these operational measures caused significant seepage losses from Northeast Shark Slough and left some wetlands drier than before the program. The agreement also promised seasonal groundwater lowering to aid farming.

**B.6 ENP/EE Resource Planning and Management Committee (RPMC) (1984-85)**

Governor Bob Graham established the Everglades National Park/East Everglades Resource Planning and Management Committee (RPMC) under the Areas of Critical State Concern program. The RPMC was a response to the threat of local land use policy change in the East Everglades. The RPMC represented multiple interests with the purpose of developing a plan for the area. The South Florida Water Management District's internal East Everglades Task Force (formed in late 1983) assisted the committee with data analysis and policy development, and the state's Department of Community Affairs drafted the plan. Governor Graham and the Florida Cabinet adopted the RPMC's Implementation Plan that recommended state land acquisition of undeveloped areas (not federal acquisition because of lack of support by the Ronald Reagan Administration) and flood protection and density limits for the 8½ Square Mile

Area. The RPMC led to the formation of the Southern Everglades Technical Committee (see B.7). The RPMC also provided input to the Experimental Program.

**B.7 Southern Everglades Technical Committee (SETC) (1985-88)**

The Everglades National Park/East Everglades Resource Planning and Management Committee's Implementation Plan (see B.6) created the Southern Everglades Technical Committee for the purpose of addressing technical uncertainties and resolving conflicts. Members of the SETC were technical representatives of many of the groups that had participated in the RPMC. Following disbandment of the SETC several years later, there was not strict adherence to the Implementation Plan.

**B.8 Interagency Committee to Review the C-111 Interim Plan (1988)**

The South Florida Water Management District asked the U.S. Army Corps of Engineers to address impacts of the Experimental Program on the C-111 basin. A year later, public attention grew after flood releases caused damage to the southern estuaries in the basin. Since the typical Corps planning process was lengthy, the District proposed the C-111 Interim Plan. An interagency committee of federal, state, and local agencies reviewed and approved the plan.

**B.9 East Everglades Land Acquisition Task Force (1988)**

Governor Bob Martinez formed the East Everglades Land Acquisition Task Force to focus on acquisition of East Everglades land as originally set forth by the Everglades

National Park/East Everglades Resource Planning and Management Committee's Implementation Plan (RPMC) (see B.6). The land acquisition had faltered because of farmer and landowner resistance, and lack of attention by the state. Governor Martinez specifically asked the Task Force to consider whether the state should be in favor of the expansion of Everglades National Park into the East Everglades. The East Everglades Land Acquisition Task Force included many of the agencies that had participated in the RPMC, as well as environmental groups and private landowners. The East Everglades Land Acquisition Task Force recommended expansion of Everglades National Park and the provision of flood protection for the 8½ Square Mile Area (to which ENP agreed).

**B.10 DOI and Corps Partnership to Implement MWD Project (1989-present)**

The Everglades National Park Protection and Expansion Act and subsequent plan for the Modified Water Deliveries Project created an unusual arrangement whereby the U.S. Department of the Interior (DOI) provided funding and the U.S. Army Corps of Engineers designed and constructed the project. This led to Corps frustration as the DOI changed project requirements and withheld funding. A DOI Inspector General report as late as 2006 noted ongoing problems with lack of DOI oversight and poor communication between the two agencies. For example, it was not until 2004 that the DOI required the Corps to report project status and costs.

**B.11 Mediation for MWD Project Impact on Snail Kites (1990)**

Monitoring of the impacts of the Experimental Program led the U.S. Fish and Wildlife Service to conclude that the program would jeopardize the snail kite and degrade its critical habitat under drought conditions. The National Audubon Society arranged an interagency mediation and research of alternatives. This resulted in a revised water delivery plan that maintained a kite drought refuge. The revised plan was the recommended alternative for the Modified Water Deliveries Project.

**B.12 Development of the C-111 Project (1990-94)**

While the C-111 Interim Plan was in place, the Everglades National Park Protection and Expansion Act authorized reevaluation of the C-111 system to address the need for restoring flow to Taylor Slough and the Everglades National Park panhandle (south of the C-111 canals; see Figure 4). An interdisciplinary team of federal and state/regional agencies and agricultural interests developed project alternatives.

**B.13 East Everglades 8.5 SMA Study Committee (1994-95)**

Amendment of the Everglades National Park Protection and Expansion Act suggested acquisition of the 8½ Square Mile Area (8.5 SMA) and conflict resulted. Governor Lawton Chiles established the East Everglades 8.5 SMA Study Committee to analyze the relationship between the 8.5 SMA and restoration of flow to Northeast Shark Slough and the impacts of alternative plans. The East Everglades 8.5 SMA Study Committee membership was the main federal and state/regional agencies, and representatives of environmental and 8.5 SMA interests. The Committee recommended the acquisition of the western half of the 8.5 SMA to serve as a buffer, and the provision of flood protection for the other half. Even though the U.S. Army Corps of Engineers had participated (expressing restrictions, however), the agency refused to sign an agreement for the recommendation. The Committee's recommendation eventually formed the basis of the South Florida Water Management District's Locally Preferred Option for the 8.5 SMA.

### B.14 Southern Everglades Restoration Alliance (SERA) (1996-98)

Five agencies (the National Park Service, U.S. Army Corps of Engineers, South Florida Water Management District, U.S. Fish and Wildlife Service, and Florida Department of Environmental Protection) formed the Southern Everglades Restoration Alliance (SERA) to coordinate the restoration projects in the area (the Experimental Program, Modified Water Deliveries Project, C-111 Project, and L-28 Project (between ENP and Big Cypress Swamp)). SERA's meetings were generally open to the public and other agencies and stakeholder groups attended. The Miccosukee Tribe, however, filed a lawsuit alleging violation of open process requirements, and SERA disbanded. The Miccosukee asserted that SERA influenced decisions regarding the 8½ Square Mile Area and the Cape Sable seaside sparrow.

### B.15 Interagency Sparrow Mediations, including for ISOP and IOP (1998-2001)

In late 1997 the U.S. Fish and Wildlife Service (FWS) found that operations under the Experimental Program jeopardized the Cape Sable seaside sparrow and recommended immediate changes. The Corps responded that the FWS position risked catastrophic failure of the water management system. The agencies brought in conflict resolution experts, and the Corps coordinated with the U.S. Council on Environmental Quality to speed the planning process for the emergency actions. The agencies reached agreement for an initial emergency deviation from the Experimental Program, however conflict remained. Numerous interagency meetings occurred, the American Ornithological Union provided mediation, and the South Florida Ecosystem Restoration Working Group (see Appendix C, C.5) assembled a technical panel with members nominated by the Union. The technical panel supported the need for operational changes to protect the sparrow. The Council on Environmental Quality facilitated high-level interagency negotiations to develop the 2000 Interim Structural and Operational Plan (ISOP), with environmental groups presenting at one of the meetings. Interagency meetings continued to make adjustments to ISOP and developed alternatives for the next plan, the Interim Operational Plan (IOP).

In early 2001 the U.S. Institute for Environmental Conflict Resolution mediated interagency development of the IOP. Public criticism of the draft plan, and South Florida Water Management District concerns about the plan's impact on water supply, led to another round of mediation. The result of the mediation was a new alternative that met the District's concerns. Several groups then expressed concern over flood risk to development, and the District withdrew its support for the alternative. The agencies resumed mediation, which resulted in a revised alternative that also addressed flooding.

### B.16 Decomp Project Planning (2000-present)

The WCA 3 Decompartmentalization and Sheet Flow Enhancement (Decomp) Project was one of the initially authorized projects under the Comprehensive Everglades Restoration Plan. In 2002, after professionally facilitated development of the project's Project Management Plan, the U.S. Army Corps of Engineers suspended project planning because the Modified Water Deliveries Project had not been completed. Corps' planning of the Decomp Project resumed in 2005, and RECOVER (see Appendix C, C.9) developed the Decomp Adaptive Management Plan (DAMP) using professional facilitation for collaboration with the agencies, tribes, and stakeholder groups (including environmental and recreational fishing interests). The purpose of DAMP was to address scientific uncertainty through data analysis and large-scale experiments/modeling. Following development of DAMP and amendments to the Project Management Plan, the federal and regional/local interagency Decomp Project Delivery Team was reconvened, and the South Florida Ecosystem Restoration Task Force formed an ad hoc subcommittee to provide input to the planning team. The initial focus of Decomp Project planning was on the removal of the Miami Canal and replacement (or enhancement) of water supply capacity.

**B.17 CSOP Project Delivery Team and Advisory Team (2001-07)**

The Combined Structural and Operational Plan (CSOP) was an integrated plan for several features of the Modified Water Deliveries and C-111 projects. In 2001 the U.S. Army Corps of Engineers convened an interagency CSOP Project Delivery Team aided by a professional facilitator. Because of the ongoing controversies over these projects and early criticism of the CSOP planning process, the Corps sought stakeholder involvement beyond that which could be achieved through the Water Resources Advisory Commission (see Appendix C, C.10). In response, the South Florida Ecosystem Restoration Task Force convened the multi-stakeholder (residential, agricultural, environmental, and recreational interests) CSOP Advisory Team to provide consensus recommendations. The CSOP Advisory Team issued guidance concerning project objectives and provided input on project alternatives. The CSOP Advisory Team was unable to reach consensus regarding seepage management and recommended continued efforts to find solutions acceptable to the multiple needs.

# APPENDIX C

# ECOSYSTEM LEVEL COLLABORATIVE PROCESSES

**C.1 Governor's Conference on Water Management in South Florida (1971)**

In response to an extreme drought and impacts on water supply, Governor Reubin Askew convened the Governor's Conference on Water Management in South Florida. Held over several days, the Conference assembled 150 technical and planning/policy experts with diverse knowledge and affiliations, including agricultural, environmental, and governmental interests. The conference was co-chaired by ecologist Art Marshall and growth management expert John DeGrove. The Conference's recommendations led to the passage of several state laws in 1972, including the Water Resources Act (which established the water management districts), the Environmental Land and Water Management Act (which created the Areas of Critical State Concern program), the State Planning Act (which formed the Division of State Planning), and the Land Conservation Act (to publicly acquire environmentally sensitive lands).

**C.2 Save Our Everglades Program and Coordinating Committee (1983-90)**

Under public criticism for environmental problems, especially in the Kissimmee River Basin and Everglades National Park, Governor Bob Graham met with environmental advocates (including Art Marshall) and held a summit of the main state environmental agencies and the South Florida Water Management District. The result was the Save Our Everglades Program and state-based interagency Kissimmee-Okeechobee-Everglades Coordinating Committee to implement the program. The goal of the program was to significantly restore the ecological health of the South Florida watershed, primarily through a holistic perspective and project coordination. Save Our Everglades initially focused on six preexisting restoration projects (such as the

Experimental Program), and gradually added projects as they were created. Save Our Everglades did not address the phosphorus threat. The Committee issued annual progress reports through the Governor's Office.

### C.3 Lower East Coast (LEC) Water Supply Plan Advisory Committee (1990-98)

In 1989 state legislation required each water management district to prepare water supply plans to forecast water needs and identify sources for the next twenty years. The District began preparation of the Lower East Coast Regional Water Supply Plan (LEC Plan) and in 1992 created a LEC Plan Advisory Committee with urban, agricultural, and environmental representatives. In 1995 the LEC Plan planning process merged with the Central and Southern Florida Project Restudy to reduce duplication of effort. The draft LEC Plan did not meet new legislative requirements for environmental protection, so the District issued the LEC Interim Plan. The Interim Plan established "minimum flows and levels" for protection of natural areas (as required by state law), but it also continued to rely on the Everglades for water supply and maintained the existing farming practices in the Everglades Agricultural Area. The final LEC Plan authorized in 2000 relied on the Comprehensive Everglades Restoration Plan to meet the projected water demand.

### C.4 Central and Southern Florida Project Restudy (1992-99)

After the U.S. Congress authorized the "Reconnaissance Phase" of the Central and Southern Florida Project Restudy in 1992, and at the urging of the U.S. Department of the Interior, the U.S. Army Corps of Engineers solicited planning input from Everglades National Park and Loxahatchee National Wildlife Refuge. The South Florida

Water Management District, feeling excluded, formed its own team to communicate with the Corps. A year later, Secretary of the Interior Bruce Babbitt established the South Florida Ecosystem Restoration Task Force and Working Group (see C.5) to unify the federal agencies in support of the Restudy. In 1994 Governor Lawton Chiles convened the state/regional/locally-oriented Governor's Commission for a Sustainable South Florida (see C.6). In early 1995 the District's Lower East Coast Water Supply Plan planning process (see C.3) combined with the Restudy. Toward the end of the Reconnaissance Phase in mid 1995, the Corps invited stakeholders to develop a process plan for the "Feasibility Phase." The Corps then formed the Restudy Team consisting of over 100 interagency (and tribal) technical and planning experts. In 1998, as the Comprehensive Everglades Restoration Plan was being finalized, the Corps formed an interagency Implementation Team to formulate the CERP implementation plan.

**C.5 South Florida Ecosystem Restoration Task Force and Subgroups (1993-present)**

U.S. Department of the Interior Secretary Bruce Babbitt initiated the South Florida Ecosystem Restoration Task Force and Working Group to enable federal support and guidance for the Central and Southern Florida Project Restudy. The original Task Force consisted of the heads of five federal Departments and the U.S. Environmental Protection Agency, with the Assistant Interior Secretary serving as chair. The original Working Group membership was Florida-based senior officials of ten federal agencies. The function of the Working Group was to evaluate restoration efforts, identify interagency conflicts, and recommend actions to the Task Force. The Working Group created several subgroups, including the Science Coordination Team. The 1996 Water

Resources Development Act expanded Task Force membership to include state, regional, local, and tribal governments. The Task Force had an administrative staff including an executive director.

Most notably, the Working Group immediately produced a controversial Federal Objectives Report that advocated dramatic measures to restore Everglades ecological health. Later, the Working Group mainly assembled technical experts to weigh in on controversial science and provided information for annual activity reports. The Science Coordination Team prepared a plan for coordinating science and established a set of ecological indicators to evaluate restoration progress (largely drawn from Comprehensive Everglades Restoration Plan (CERP) evaluation indicators). For oversight of CERP, the Task Force contracted with two successive National Academy of Sciences independent review panels. Most recently, the Task Force was drafting an Integrated Schedule to improve coordination between CERP and non-CERP projects (such as the Modified Water Deliveries Project).

**C.6 Governor's Commission for a Sustainable South Florida (GCSSF) (1994-99)**

Governor Lawton Chiles created the Governor's Commission for a Sustainable South Florida (GCSSF) to provide a state response to U.S. Department of the Interior Secretary Bruce Babbitt's call for collaborative ecosystem management during the Central and Southern Florida Project Restudy. The Florida Conflict Resolution Consortium designed and facilitated the process, and Richard Pettigrew, a former Florida Speaker of the House, was chair. GCSSF membership included a wide range of public and private stakeholders. The GCSSF issued a series of consensus-based reports to

Governor Chiles. The first report declared the current path of South Florida to be "unsustainable" and made over a hundred recommendations. The 1996 Water Resources Development Act directed the U.S. Army Corps of Engineers to incorporate GCSSF input (especially the GCSSF's Conceptual Plan) into the Restudy and suggested that the South Florida Ecosystem Restoration Task Force (see C.5) designate the GCSSF as an advisory body (which it did). Last, the GCSSF commented on the draft Comprehensive Everglades Restoration Plan implementation plan.

### C.7 Governor's Commission for the Everglades (GCE) (1999-2001)

Newly elected Governor Jeb Bush replaced the Governor's Commission for a Sustainable South Florida (see C.6) with the Governor's Commission for the Everglades. Membership included the sugar industry, an environmental group (the Florida Audubon), urban development interests, and local officials. The stated purposes of the GCE were to enable public participation and improve decision making, especially for implementation of the Comprehensive Everglades Restoration Plan (CERP), and to act as an advisory body to the South Florida Ecosystem Restoration Task Force (see C.5). The GCE met six times, focusing on early CERP implementation issues. The GCE used majority voting rather than consensus building to make recommendations, for which there were few. When the executive order creating the Governor's Commission for the Everglades expired, the GCE recommended that the South Florida Water Management District create a forum for stakeholder involvement. The District's Governing Board thus established the Water Resources Advisory Commission (see C.10).

### C.8 South Florida Water Quality Protection Program (1999-2003)

The Florida Department of Environmental Protection, with funding from the U.S. Environmental Protection Agency (EPA), created the Water Quality Protection Program to coordinate the state's Total Maximum Daily Load program (especially regarding pollution from urban development) and water quality restoration activities under the Everglades Forever Act and the Comprehensive Everglades Restoration Plan. The program established an Interagency Management Committee consisting of various state, regional, local, and tribal governments, and the EPA. The Miccosukee Tribe declined to participate. The program got off to a slow start due to inadequate staffing, and the program was suspended.

### C.9 Comprehensive Everglades Restoration Plan (CERP) (2000-present)

Implementation of the Comprehensive Everglades Restoration Plan (CERP) began in 2000 when the U.S. Army Corps of Engineers and South Florida Water Management District signed a Design Agreement for selected projects. The agreement created the Design Coordination Team composed of the District, Corps, and Florida Department of Environmental Protection. The Water Resources Development Act of 2000 specified institutional measures to guide federal and state/regional coordination for CERP implementation, including the interagency development of Programmatic Regulations. In 2003 the Programmatic Regulations established the multi-agency RECOVER (Restoration Coordination and Verification) group out of individuals who had been involved in the Restudy Team (and had continued to meet informally since CERP's approval). In 2005 the Corps and District formed the CERP Quarterly Review

Board to discuss issues and project status among a small group of leaders. The QRB focused on streamlining CERP implementation and resolving issues between agencies.

**C.10 Water Resources Advisory Commission (WRAC) (2001-present)**

At the request of the Governor's Commission for the Everglades (see C.7) (which was disbanding), the South Florida Water Management District's Governing Board established the Water Resources Advisory Commission (WRAC) to provide consensus recommendations to the board on all aspects of water resource protection. The WRAC's almost fifty members represented business, agricultural, environmental, community, governmental, and tribal interests. The WRAC met frequently (monthly), held many focused "issue workshops," and formed special issue sub-committees (such as concerning Lake Okeechobee). The WRAC initially used facilitation provided by the South Florida Regional Planning Commission, but soon switched to direction by the WRAC chair (a member of the District's Governing Board, who was Mike Collins until 2009). In 2002 the South Florida Ecosystem Restoration Task Force (see C.5) designated the WRAC as an advisory body, and the two groups met together once a year. The main issues addressed by the WRAC were the Comprehensive Everglades Restoration Plan (and the state's related Acceler8 initiative), water assurances, regional water supply, Lake Okeechobee management, land acquisition, recreation (which affected the Decomp Project), and the Long term Plan for Water Quality.

APPENDIX D

INTERVIEW RECRUITMENT SCRIPT AND CONSENT FORM

# Recruitment Script

**Georgia Institute of Technology**
**Project Title: The Role of Collaboration in Improving Ecosystem Management**
**Investigators:** *Kathryn Frank (doctoral candidate) and Michael Elliott (advisor and principal investigator)*

**<u>Recruitment script – Telephone or e-mail</u>**

Hello or Dear _________:

My name is Kathryn Frank. I am a doctoral candidate in the City & Regional Planning Program at Georgia Tech, and my dissertation research is examining the impacts of collaboration and consensus building on the Everglades restoration. My dissertation is unique because it asks how collaborative processes compare to and interact with political and bureaucratic approaches over time. Most previous research of collaboration has focused on individual processes.

I am requesting an interview with you concerning the roles of collaborative decision-making processes in south Florida because of your involvement in or observation of such processes. Your participation in my dissertation research is completely voluntary. The interview would be open-ended and take about 45 minutes, and I will record your responses with hand-written notes. I would like to meet you and conduct the interview in person if possible. I will be in your area on X days. If an in-person interview is not possible, I could call you at your convenience.

Please let me know if you have any questions or would like to receive the interview questions in advance. Thank you.

Sincerely,

Kathryn Frank
Doctoral Candidate
City & Regional Planning Program
College of Architecture
Georgia Institute of Technology
Atlanta, GA
(541) 683-1514
kifrank@mac.com

## CONSENT FORM

**Georgia Institute of Technology**
**Project Title: The Role of Collaboration in Improving Ecosystem Management**
**Investigators:** *Kathryn Frank (doctoral candidate) and Michael Elliott (advisor and principal investigator)*

**Research Consent Form**

**You are being asked to be a volunteer in a research study.**

**Purpose:**

- The purpose of this study is to see if *use of teamwork improves governance's ability to incorporate environmental and long-range perspectives, coordinate the activities of diverse stakeholder groups, and attend to emerging and pressing environmental problems. The research will examine how teamwork achieves these results directly through collaborative process outcomes and indirectly through increasing the capacity of political and bureaucratic governance. Approximately 100 government officials and civic leaders will be interviewed for this research. You were selected for interview because of your involvement in or observation of collaborative decision-making processes for restoration of the south Florida ecosystem.*

**Procedures:**
If you decide to be in this study, your part will involve:

- *An open-ended interview with Kathryn Frank that will take approximately 45 minutes. The interview may occur in person at a location of your choosing (typically an office or a public place, but not a private residence) if Kathryn Frank is in the area or over the telephone.*
- *If you prefer, Kathryn Frank will e-mail you the interview questions in advance with enough time for your review.*
- *Kathryn Frank will record your responses by taking notes during the interview. The interview will not be audio or video recorded.*

**Risks/Discomforts**
**The following risks/discomforts may occur as a result of your participation in this study:**

- *The risks involved are no greater than those involved in daily activities such as your involvement in public affairs as a government official or civic leader.*

**Benefits**

**The following benefits to you are possible as a result of being in this study:**

- *There are no direct benefits, however you may benefit from being in this study as a government official or civic leader because the lessons learned in the dissertation will directly pertain to your involvement in public decision-making in south Florida. The lessons learned will not be available until the dissertation is finalized in about May 2006.*

**Compensation to You**

- *There is no financial compensation for participation in this research.*

**Confidentiality**

- *You have the option of maintaining confidentiality or being cited by name when your interview responses are used in the dissertation. No direct quotes will be used. You will have the opportunity to review the text in which your identity appears, to ensure proper attribution.*
- *The Georgia Institute of Technology IRB has the right to review study records to ensure that the research is being carried out in the proper way.* The Office of Human Research Protections may also look at study records.

**Costs to You**

- *There are no costs to you other than your time to participate in an approximately 45 minute interview.*

**Subject Rights**

- **Your participation in this study is voluntary. You do not have to be in this study if you don't want to be.**
- **You have the right to change your mind and leave the study at any time without giving any reason, and without penalty.**
- **Any new information that may make you change your mind about being in this study will be given to you.**
- **You will be given a copy of this consent form to keep.**
- **You do not waive any of your legal rights by agreeing to participate in this study.**

**Questions about the Study or Your Rights as a Research Subject**

- **If you have any questions about the study, you may contact Dr. Michael Elliott, at telephone (404) 894-9841, or Kathryn Frank, at telephone (541) 683-1514.**
- **If you have any questions about your rights as a research subject, you may contact Ms. Melanie Clark, Georgia Institute of Technology at (404) 894-6942.**

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